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MUNICIPAL JOURNAL AND ENGINEER



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SPECIAL NOTICE

In the respective following issues of the Municipal Journal and Engineer considerable space will be devoted specially to the subjects as indicated:—

—1906—

- September 5th - - THE CITY BEAUTIFUL
—Parks, Monuments, etc.
- October 3d - - - FIRE AND POLICE
- November 7th - - LIGHTING
—Gas, Electricity, Etc.
- December 5th - - BRIDGES

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AND ENGINEER, either in the form of special articles or of letters
discussing matters of current interest.

It is also desired that the facilities furnished by the reference
library in this office should be widely known and freely used by
those interested in municipal affairs. Visitors will be welcomed
and provided with conveniences for search, and inquiries by mail
will be promptly dealt with.

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Ice Again

IN this issue will be found a most interesting summary of events, together with collated opinions in the shape of answers to questions submitted to a number of recognized experts in regard to the use of manufactured ice as against the employment of natural ice. We anticipate this article will attract as much attention as did the one on page 107 of our issue of August 1st. The whole question cannot be too plainly placed before all those who have the matter at heart and who earnestly desire that there shall not be in any coming years such a deplorable condition of things as at present exists and is likely to continue throughout 1906, and until definite action is taken.

How Hagerstown, Md., Lights Up

THE city of Hagerstown, Md., is lighted by a well-equipped municipal electric plant, from which power is also furnished consumers at uniform rates. The receipts last year for commercial lighting and power for industrial purposes amounted to \$17,971. The expenses of the plant for the year were \$17,434, showing a net profit of \$537. During the year \$10,878.33 was spent for improving the plant, which represents a total valuation of \$58,634.98. The cost of light-

ing per lamp for 134 arc lamps, we are informed, was \$22.87. The equipment of the Hagerstown plant consists of three Westinghouse generators, 2-phase; three Buckeye compound engines, and four 250-horsepower boilers. The plant was constructed five years ago, since which time a total of \$25,604 has been expended for various improvements and alterations.

Dealing with Drunks

GLASGOW, Scotland, goes about this thing in a thorough, practical manner, and has a Municipal Inebriate Reformatory, under the management of a committee of 22, including the Lord Provost and a prominent physician. In 1905 there were 113 inmates under treatment, an increase of 27 over 1904 or of 67 since the year the institution was opened, viz., 1901. The ages vary from 17 to 50 years, the average being 29 years. The occupations of these unfortunates range from rag-pickers to circus riders, though, curiously enough, domestic servants, including kitchen maids, cleaners, charwomen, etc., are in the ascendance. The religious beliefs of the "patients" are about equally divided between Protestants and Roman Catholics. A plain though nourishing and substantial four-meals-a-day diet is provided, and the time table of work, etc., runs from 6 A.M. to 9:30 P.M., when "lights are out." A number of the inmates are permitted, accompanied by an attendant, to be away for a day to visit friends. They are also employed at sewing, knitting and farm work, being carefully trained in these things. Gratuities are given for good behavior and small payments are made for work done. The managers make monthly visits, and the Government Inspector comes and looks things over several times a year. Education is not neglected, as the inmates are taught writing, spelling, arithmetic, etc., while suitable games and also music are indulged in. There were fourteen escapes during the year; one inmate is still at large. The place is not walled in so that the difficulties of getting away are not great. Sixteen were discharged in the twelve months. Six out of these relapsed and had convictions recorded against them since their discharge, for being found the worse for liquor. The cost of running the home is about \$10,108. The revenue, including the balance brought forward, is about \$10,200. The Farm operations cost about \$5,020. From the sale of products, etc., about \$50 more than the cost was realized, and this turned over to the benefit of the Home account. The medical report shows the various causes and treatments. Altogether, the results are most encouraging and satisfactory. The humaneness of the method is beyond question. The benefit to the erring units and humanity generally is without doubt.

THE ICE SUPPLY PROBLEM AGAIN

IN the issue of August 1st the ice-supply problem was dealt with, but neither at the length nor in the detail that is now given. Therein was set forth the efforts that Mount Vernon, New York, was making to overcome the difficulties of a shortage of supply and of increase in price.

The article appears to have attracted more than usual attention, as it has been copied or quoted from by scores of publications throughout the United States; many editorials have also been written thereon—though a number of newspapers have omitted to give credit to the MUNICIPAL JOURNAL AND ENGINEER, this, it is presumed, being an oversight incidental to the rush of daily journalism.

The fact exists—there can be no question about it—that the problem is a most serious one and that dealers are taking every possible advantage of the shortage and the scare and have raised and are raising their prices accordingly. On page 116 in the same issue will be found a comment upon the very extraordinary situation which has now become so much accentuated.

Reports from many centers show the vital importance and urgency of the matter.

PENSACOLA, FLORIDA.—It is learned that, since the dissolution of the Consumers' Ice and Fuel Company—the local trust—an absolute revolution has taken place and there is now no difficulty whatever experienced in obtaining supplies. Indeed there are pleasing and increasing inclinations on the part of the dealers to supply the public, that are as interesting as they are peculiar and show what prompt legal action on the part of the authorities will do. The dealers have been given ten days in which to reduce their prices.

NEW YORK CITY.—The authorities, unwilling to pay the exorbitant increase of price, are erecting a forty-ton plant—to be in operation in a month—at a cost of \$32,000, to have a storage of 900 tons. The ice, it is expected, will cost \$1.35 a ton, and thus thousands of dollars will be saved annually in addition to the security of purity and regular delivery. This may be followed by other plants. The Grand Jury has not yet completed its inquisition, and it is doubtful if any charge will be sustained.

PHILADELPHIA, PA., has fourteen dealers or managers of companies under indictment who will be tried on September 3d. They are charged with conspiracy. Smaller dealers are also suing manufacturers to compel them to fulfill their contracts.

BOSTON, MASS., has an ice famine pending if the prophecy of Mr. Charles W. Hallstram, Secretary of the Massachusetts Ice Dealers' Association, should come true. He predicts that, owing to the short crop and unusual heat, things look bad for the late season. The officers of this association, including Mr. Hallstram, have been indicted.

HOLYOKE, MASS.—The Board of Aldermen are seeking powers to establish a municipal ice plant, as the

local ice combination has a twenty years' privilege to harvest ice on the city reservoir, the only available source of the regular supply of pure ice.

BALTIMORE, MD., is naturally anxious, and the beginning of a scarcity seems to have been already reached.

EASTERN CALIFORNIA AND NEVADA are divided between two companies, who appear to dictate both prices and terms. The Union Ice Company of Reno demands seventy-five cents per 100 pounds. Furthermore, supplies are frequently absent for a day at a time.

JACKSONVILLE, FLA.—The manufacturers here have been scared into making an agreement in writing, undertaking to supply ice at a maximum of 25 cents per 100 pounds, and thus end an unpleasant litigation.

MADISON, WIS.—The District Attorney alleges that the three dealers in La Crosse who control the greater part of the ice there, are in an illegal combination.

TOLEDO, O.—The Federal authorities are going to investigate things, anticipating that evidence will be forthcoming concerning the trust and the railroad. The convicted ice men have been sentenced.

NEW HAVEN, CONN.—The Mayor is considering a plan to build a dam where 5,000 tons of ice can be obtained to be sold at cost by the city. This to prevent the trust from repeating its high prices.

The Springside Farm plant is to be enlarged. This on the proposition of prominent financial people here, so as to increase the storage from 1,900 to 4,000 tons—more than double. This is directly in the interests of the poor. This year already 800 tons at \$3 a ton have been sold from this plant.

BIRMINGHAM, ALA., is going to investigate the alleged ice trust and report accordingly.

MOBILE, ALA., will erect its own plant of fifty tons per day, which, if successful, will be doubled.

PATERSON, N. J.—The butchers have associated themselves and are going to run their own ice plant. They anticipate selling to members at 10 cents per 100 pounds. They are now paying 40 cents.

COUNCIL BLUFFS, IA.—The ice trust demands \$14 per ton, whilst it is claimed that the cost of manufacture is only \$1.50 per ton. The City Council has arrived at the conclusion that it can do nothing better than to go into the business for itself.

PROVIDENCE, R. I.—The Board of Trade has determined to save the city from high prices by buying 20,000 tons of ice in Maine and selling it at a reasonable price.

KANSAS CITY, MO., is having a hearing as to the merits, demerits and competition of the Consumers' Ice Company and its rival, the People's Ice Company, and some interesting evidence is likely to be forthcoming.

A number of questions have been put to various specialists in the manufacture of ice, including the De La Vergne

Machine Company, from which a selection, together with answers to them, is here given:

Question 1. Can absolute continuity of supply be guaranteed by the erection of plants? *Answer.* Yes.

Question 2. Can absolute purity always be relied upon in manufactured ice? *Answer.* Yes.

Question 3. What sizes of plants can be erected? *Answer.* Any size, from the smallest to the largest. There is no limit to capacity.

Question 4. Does not the manufacture of ice practically do away with the large storage and hauling expenditures consequent upon cutting and handling natural ice? *Answer.* Yes. Artificial ice plants only require sufficient storage capacity to carry them over from day to day.

Question 5. Can you supply actual data showing the cost of operating a plant? *Answer.* No. The cost of operating an ice plant depends entirely upon local conditions and the size of the plant; according to circumstances ice can be manufactured at from 65 cents to \$1.75 per ton, actual cost to manufacture. This, however, does not include any office or management charges.

Question 6. What are the respective melting points of natural and manufactured ice? *Answer.* The melting point of both natural and manufactured ice made from pure water is 32° F.

Question 7. How long will natural and manufactured ice, respectively, keep? *Answer.* Natural and artificial ice, under the same conditions, that is, having the same temperature and having their surfaces equally exposed to the action of the air, will last the same length of time, but as a practical matter, the brine in the freezing tanks where artificial ice is made is kept at a constant considerably lower temperature than prevails on lakes, ponds or rivers where natural ice is formed. Further, the process of manufacturing ice is such that a solid mass of congealed water is the result, without any crevices or soft places in the cake, such as exist in natural ice. For these reasons it ordinarily takes longer to melt a cake of artificial ice than a cake of natural ice of the same weight. But this question, of which lasts the longer, depends entirely on the quality of the ice and the amount of surface exposed to the action of the air.

Question 8. Should not manufactured ice be used for ice-cream and other food products absolutely instead of natural ice, on the score of certainty of purity, and will it not answer as well for making these things? *Answer.* Manufactured ice is by all means preferable.

Question 9. What would be a fair margin to allow for meltage? *Answer.* Meltage depends entirely upon the shipping facilities and the distance it has to be carried. Thirty per cent. is an average figure.

Question 10. Do brewers and others making their own ice do this to be certain of supply or for economic reasons? *Answer.* It is surmised from the above question that there is an impression that brewers make ice for cooling their breweries, but this is not the fact. Breweries are cooled by refrigeration produced by mechanical means. The same principles are involved as in making ice, but instead of

freezing water, the heat is taken out of the air in the various rooms and cellars to be cooled. There are quite a number of breweries, however, who manufacture some ice to be used in shipping their beer, and they can do this very economically, for the reason that they do not require any additional help in the way of engineers, etc., inasmuch as that class of labor is already in the employ of the brewery itself.

Question 11. Would it not be better for health to give up using natural ice altogether and use only manufactured ice? *Answer.* It most assuredly would. More than one instance is known where epidemics of typhoid were traced directly to the use of natural ice obtained from impure sources.

Question 12. Would it not be possible for a city to construct its own reservoir of potable, filtered water for natural ice, when climatic conditions permit, and would this cost more than manufacturing it? *Answer.* Yes. This would be possible, but it would not be a good commercial proposition, for it would be found that the total cost of this ice would be greater than that of manufactured ice, if interest on the investment is considered. Even with such an installation, the ice would not be as pure and clear as manufactured ice.

Question 13. Would not manufactured ice place the city in a position of independence of natural ice and a certainty of its supply? *Answer.* Yes.

Question 14. a. It is claimed that in severe winters the natural ice supply is so prolific that it would throw out of work a manufactured ice plant. Would this become absolutely idle? *b.* Is there anything else it could do, and could not the plant, with a view of reducing working expenses, remain in charge of a caretaker without serious detriment, until it was required again? *Answer. a.* People who have once become accustomed to the use of artificial ice will never revert to the use of the natural product. *b.* An artificial ice plant will never need to be shut down entirely.

It would, therefore, seem from the above overwhelming evidence that the solution of the problem lies in the hands of the people themselves, whether as stock-owners of corporations installing ice-plants, or citizens of municipalities erecting and controlling them.

It is interesting to note in this connection the great growth of artificial ice manufacture. Five million tons a year is now turned out, nearly one-third of which is used in the South. The United States, with its population of 83,000,000, appears to require at the minimum of two tons per day per thousand population, the enormous amount of 166,000 tons a day or 60,590,000 tons a year. There were but four artificial ice plants in the United States in 1870. There are now over 1,000 in operation. The capital employed is over \$50,000,000. Ice in ten years has crept up in price 50 per cent. A recent inquiry shows that ice is dearer in the North than in the South. It is also conceded that short weight and the irregularity in the sizes of, apart from the loss in breaking up, the large cakes of natural ice are features too often lost sight of.

Metropolitan Items and Notes.—About 100,000 passengers have had to walk Brooklyn Bridge, owing to a breakdown. An equal number of votes would easily be lost at a current municipal election.

The doctors on the East Side are in favor of public ice plants, claiming that ice is often as necessary as drugs. We all know that. Get a move on and the stuff manufactured.

The Hon., the Comptroller, says the "loop" is certain and the Acting Mayor favors it. Well, why not?

"The public should demand lower telephone rates," cries Mr. Louis M. Fisher in a letter to one of the evening papers. What is the good of "demanding?" The telephone people do just about what they please. Five cents for a casual public call, and eight cents for a contracted, specially bargained for private one, is their creed.

The Stevens committee once brought out the fact that the Consolidated Company paid to other companies as low as 28 cents per 1,000 C. F., with a 10 per cent. discount, leaving a profit of practically 75 cents, or about 300 per cent., on the present price of \$1. Yet the Consolidated Company claims that it cannot supply 80 cent gas to private consumers. What does it want anyway?

Children, by a special permit of the acting Mayor, are allowed to appear in *The Little Cherub*. If it hurts them the permit is to be canceled.

The Aldermen were called back to confirm the tax rolls. They overlooked this little thing in their hurry to get home. Aldermen are more used to being called down.

A clerk and \$6,100 are missing from Ellis Island. Surely they did not keep him in one of the boats over a Sunday?

"No axe to grind" has a grumble about the dirty condition of Brooklyn's streets. Let him just come over to New York City and see what we have here.

Commissioner Bingham wants 2,000 more of the "finest" and an annual appropriation, reaching the very respectable sum of \$2,616,978, or a gross appropriation of \$15,697,681. This will require thinking out.

"The musty taste of Brooklyn's water," says Deputy Commissioner Cozier, "is due to vegetable growth, but nevertheless it is wholesome." Maybe, but people are not looking for consommé.

That the city's death rate is lower is claimed by Dr. Darlington "to be due to weather and rigid food inspection, particularly of fruits and milk." The inspection may be all right, but the allusion to the weather is unfortunate.

The warehouse appropriation of \$400,000 has been vetoed by a vote of Aldermen, who want a less costly site for a supply depot for the Board of Education. It does seem a lot, but should it be grudged?

"J. L." writes a pathetic letter to a daily paper, complaining about certain noises in the streets, which he terms nuisances. The noises specified are those of itinerant oratory and music.

Acting President Desmond Dunne to Mr. W. E. Winter, who has been saying things: "We are at least in a position to block illegal grabs of further territory until the new line will be run better than the old one." We will now wait and see.

MUNICIPAL NEWS

ALABAMA, Birmingham.—The following letter is one of a number that have been received by the Mayor: Chocorua, New Hampshire, July 24.—The Mayor, Montgomery, Ala.: Dear Sir—I write to ask if you will send me a copy of the Municipal Meat Inspection ordinance, now in force in your city. It has been recommended to me, by a friend well informed, as in many respects the best in force in any city in our country. Thanking you in advance for your courtesy, I remain, very truly yours, James Bronson Reynolds.

Ensley.—The volunteer firemen celebrated the opening of their new quarters in the City Hall with a barbecue. The city officials were entertained by Chief J. A. Tetlow and the members of the department.

ARIZONA, Naco.—It is likely that a new town will spring up on the international boundary between Nogales and Naco. Capitalists having interests in the Southern Pacific Railway are considering the construction of a \$5,000,000 smelter. A custom smelter of large capacity is all that is required to insure the opening up of scores of mines, all contributing to the business of the new town.

ARKANSAS, Little Rock.—At a representative public meeting held in this city, a movement was started for a sewer district to include the entire city, and for a paving district to include the entire downtown section, and other leading streets. Resolutions favoring both plans were adopted unanimously, and Sam W. Reyburn, President of the Business Men's League, was empowered to name two committees to formulate plans, secure all data possible, and report to a meeting to be called later. The resolutions provided that Mr. Reyburn shall be Chairman of Paving Committee. He named the following: Sewer Committee—F. B. T. Hollenberg, Ashley Cockrill and W. M. Kavanaugh. Street Committee—Charles McKee, T. H. Bunch and W. L. Terry.

CALIFORNIA, Oroville.—At a meeting of the Board of Trustees, largely attended by citizens, it was resolved that "the proper and necessary steps be taken forthwith by this board to employ a competent engineer or engineers to furnish plans, specifications and estimates for the installation and maintenance of suitable and adequate water, gas and electric plants for said city, and that said engineer be directed to make his report to this board at the earliest possible date.

COLORADO, Pueblo.—All wires of the fire and police alarm systems in the downtown paving districts are now underground. The work of putting the wires underground was completed by City Electrician Kingsley and his assistants, and the wires were connected up at the big switchboard in the central station. This expensive piece of work, involving the expenditure of thousands of dollars, includes 180,000 feet of electric wires placed in conduits, and incidentally improvements made in the system.

CONNECTICUT, Hartford.—The following resolution has been adopted by the committee investigating the rapid transit plans: "Whereas, the petition of the railway company involves the carrying interurban trolleys off the main trains into congested portions of the city, to the inevitable delay and annoyance of the public traveling on such interurban lines and to the inconvenience of wayfarers and drivers of vehicles on the local streets; voted, that such petition be denied with right to present amended plan for trolley terminal for interurban traffic and connecting belt or shuttle

local lines, which in the opinion of the committee could be favorably considered in a proper location and under reasonable conditions."

DELAWARE, Wilmington.—The members of the Union Fire Company are entitled to all the medals coming a fireman's way. Not only are they ready and anxious to respond to fire alarms, but they themselves are now busy building a new addition to their present quarters, so as to accommodate the new Metropolitan engine which the company has purchased.

DISTRICT OF COLUMBIA, Washington.—The National Capital has suddenly taken a notion that it wishes to become a commercial city. Public meetings have been held, committees appointed and various other steps taken. The new movement is based on the geographical location of the city. The men who have visions of a great commercial capital point out that Washington is the gateway of the South.

FLORIDA, Key West.—The Continental Hotel, now at Atlantic Beach, will be moved by its owner, Henry M. Flagler, to Key West. The hotel is four stories high, and, with its promenades and verandas, is nearly half a mile long. The building will be cut in halves and towed on barges. This detail of amphibious engineering is worthy of the promotor of the East Coast Railway.

GEORGIA, Augusta.—At the last Council meeting the price of the water power from a canal for the next twenty years was fixed at \$5.50 per horsepower. This gives the city the cheapest water power in the entire country. At the same meeting, the Anthony Shoals Power Company was given the right to use the streets of the city for their lines for a period of thirty years. The contract under which they will operate will be similar to the one under which the telephone company operates now. They are to pay the city 1 per cent. on the gross earnings of the company. It will be two years before this company is ready for business.

IDAHO, Pocatello.—The three men who were caught by Officer Meyers in the act of pouring whisky through a funnel to prisoners in the city jail, were haled into Police Judge Knowles' court and charged with being drunk and disorderly and resisting an officer. The prisoners put up a touching plea, saying that they did not know it was against the law to pour booze into the jail windows to thirsty inmates. "For fear you may in the future forget that such a thing is contrary to the usages of polite society," said Judge Knowles, "I will impress it upon your minds. Twenty-five dollars for you."

ILLINOIS, Chicago.—The "twelve-hours-on-and-twelve-hours-off" system has gone into effect in the first battalion of the Fire Department. Chief Horan has accomplished the seemingly impossible. He has arranged for the transfer of thirty-six men to the district bounded by the river, Twelfth street and the lake, and has maintained peace in his family of nearly 1,300.

Springfield.—The efforts being made by the Springfield & Southeastern Railway Company to effect an entrance to the city through Fourteenth and Adams streets are meeting with some opposition. The first proposition of the company to the property owners was to widen Adams street and pave it from Fifth to Fourteenth streets with asphalt. Now the property owners are receiving a proposition, which holds out as an inducement for their signatures, an offer to build a cement sidewalk on both sides of Fourteenth street, from Adams to Laurel, a distance of sixteen blocks. Some of the property owners, it is said, are withdrawing their objections.

INDIANA, Evansville.—"Any plan for the Kentucky avenue sewer that lets it empty into Bee Slough instead of carrying it all the way to the river will be fatally defective, and ought to meet with the united protests of people in the upper water front residence section," says County Surveyor W. H. Temme. "We would have a sewage front of something like three miles. All the immense volume of polluted water from the east and southeast sections of the city, instead of going directly into the main stream of the Ohio would be emptied into the slough."

Indianapolis.—The Board of Public Safety has adopted a resolution to the effect that changes in any of the subordinate departments will not be made at the same meeting at which they are asked. This applies to the Police, Fire and Building Departments and to the city markets. The board feels that it should have time to investigate, and accordingly the resolution was adopted that will require one week to elapse before changes are made.

INDIAN TERRITORY, Sulphur.—A party of capitalists from Oklahoma City has been looking over Sulphur's great artesian water supply, with a view of ascertaining the feasibility of a scheme to pipe the same to Oklahoma City in order to supply that city with what it most stands in need of, pure water. This party was surprised and deeply impressed with the magnitude of Sulphur's wells, and gave it out as their unqualified opinion that the project would be undertaken.

IOWA, Davenport.—The old Allen paving case, a source of trouble for ten years, was disposed of in a recent special council meeting. According to the agreement reached Eddy street along Camp McClellan is to be repaved. That is the brick is to be taken up, a concrete foundation put down, as many of the old brick as are good used in the repaving and the remainder to be laid with new brick. The city is to furnish what new brick is needed, an inspector to see that the work is done right and an engineer to oversee the work.

KANSAS, Eldorado.—Teams are at work distributing the pipe for the natural gas line. Work will commence at once on putting in the pipe, and Eldorado people expect to be burning natural gas by November 15.

Lebanon.—The city of Lebanon is to have a system of waterworks, and the contract calls for their completion within five months. The system when complete will cost that town something over twenty-one thousand dollars.

KENTUCKY, Glenview.—Residents at Glenview and its vicinity are making preliminary plans for the organization of a stock company with the object of laying a water main from the Louisville waterworks to that settlement. It is estimated that capital of about \$25,000 will be required, and that is the amount which is being sought for in subscriptions.

LOUISIANA, Baton Rouge.—The construction of the addition to the sewerage system will be completed about Sept. 1, announces J. H. Randolph, the manager of the work being done by Guild & Company, of Chattanooga. About six miles of sewerage pipe have been laid. The contractors are now in the most difficult part. They are laying the pipe at a depth of about thirty-two feet, and as soon as this work is completed Baton Rouge will have a splendid sewerage system that will cover the entire town.

MAINE, Portland.—A city ordinance is pending that will forbid the laying out of streets in the city of less than 60 feet in width, and will recommend that

the city shall not accept streets of less width. Upon investigation by one member of the Board of Public Works and a representative of the committee on laying out new streets it has been discovered that streets which measure only 40 feet in width including the two sidewalks are being laid out in the suburbs.

MARYLAND, Baltimore.—Chief Engineer Calvin W. Hendrick of the Sewerage Commission has submitted a special report to the Commission concerning the Jones' Falls problem. In his report he will advocate a plan not only to remove the possibility of future disastrous floods in the low sections of the city, but also for covering Jones' Falls over so as to remove an eyesore from the heart of the city. In years to come it is possible that a fine boulevard may wind its way through the city over the course of the present stream.

MASSACHUSETTS, Lynn.—Municipal control of public service corporations and laws to prevent the bribery of public servants were the two salient features of the platform adopted by the Wageearners' Club, a new political organization, made up of the trades union members, at a meeting held recently. There were a number of other drastic measures outlined as desirable, chief among them regulations relating to monopolies and the election of State and county judges and United States Senators by the people.

Wellfleet.—The town of Wellfleet has, for some years past, been vexed with a great plague of mosquitoes. But the people there have evoked the aid of the American Mosquito Extermination Society and active measures are now in progress to rid the town of the nuisance which was beginning not only to affect seriously its business interests, but to impair the public health as well.

MICHIGAN, Detroit.—A proposed agreement with the street railway, on which a vote may be taken, includes the following: Ten tickets for 25 cents during workingmen's hours, from 5 to 8 a.m. and from 4.30 to 6.30 p.m.; six tickets for 25 cents at all other times; universal transfers on all lines at all hours; the street car company to pay for all paving between the tracks instead of part of it as at present, and the company to pay a 2 per cent. tax on its entire gross earnings, instead of earnings of only part of the system as at present.

Grand Rapids.—A project for a city water supply from Lake Michigan comes up once more in the shape of an offer received from New York. The New York people promise that as quickly as the plant can be constructed, Grand Rapids will be in possession of the supply and that no bond issue will be necessary on the part of the city to acquire the plant, the cost being simply the interest on the outlay with a sinking fund provision for ultimate payment.

MINNESOTA, Kellogg.—The city is considering a municipally owned baseball park.

Owatonna.—The differences between the Owatonna City Council and the Gas, Electric and Heating Company have been settled. Although the company had a franchise it did not furnish gas in a satisfactory quantity and quality and the proposition of a municipal gas plant was considered. The matter has now been settled on the basis of \$1.40 gas and some special reduction.

MISSISSIPPI, Vicksburg.—Chief of Police Price of Vicksburg has announced his intention of enforcing the law for the protection of bird life, especially the mocking birds. The fact that negroes are trapping the birds in large numbers and selling them to tourists moved the chief to action.

MISSOURI, Kansas City.—The upper house of the City Council has passed the Fleming-Wilson natural gas ordinance, granting a franchise to a syndicate of Chicago capitalists. Gas is to be furnished for 25 cents per 1,000 feet.

MONTANA, Whitehall.—A Portland cement mill of 800 barrels capacity will soon become an industry of no small importance to the city. The company controls a shale deposit of 60 acres, which has been explored to a depth of 100 feet, insuring an ample supply of material. The necessary lime will come from a calcareous deposit eighteen miles away.

NEBRASKA, Lincoln.—If the Mississippi river persists in following an old bed of the stream, which it is now threatening to do, Nebraska may find itself with three United States Senators, and Senator Gamble of South Dakota may be retired from politics by becoming a resident of Nebraska instead of South Dakota. The Missouri is cutting into an old channel to the east of Yankton, S. D., and if the waters succeed in getting into the old bed Yankton will be thrown on the west side of the river and, therefore, into Nebraska. Senator Gamble is a resident of Yankton, and if the city is thrown into Nebraska he must move to some other town or get out of politics.

NEVADA, Reno.—While her walls are not built of Jasper, at least the streets of Reno are being paved with gold. Several thousand tons of tailings from the old site of the English mill, an institution that passed into oblivion many years ago, are being hauled to the city, converted into asphalt binder and laid on the improved streets. All these trailings carry gold. They represent the remains of what were once rich ores from the Comstock and other mines.

NEW HAMPSHIRE, Peterboro.—The little town of Peterboro, N. H., under the shadow of grand old Monadnock, boasts the first free public library supported by municipal tax in the world. The outgrowth of a semi-free social library established in Peterboro in 1799, the present situation is said to be the pioneer exponent of the free public library system.

NEW JERSEY, Paterson.—In his report to the City Council, on Passaic river purification, Allan Hazen, Consulting Engineer, advises the city to join in building a trunk-sewer provided a satisfactory outlet can be found. If, however, a disposal plant turning out an effluent of a high degree of purity should be required near the outfall of the trunk sewer, he says it would be better for Paterson to establish a plant in some swampland near by. For such a plant he recommends several alternative methods of treatment according to season of year and conditions of sewerage. Besides this a gradual change to the separate system of sewerage would be advisable so that the treatment of storm water at the plant could be avoided. In the course of the investigations certain factors were determined. The division of water from its natural channel was ascertained to be about 45 per cent.—an amount, if returned, insufficient to dilute the sewerage to such an extent as to make it unobjectionable. The pollution of the river at Newark was ascertained to be due principally to its own sewerage.

NEW MEXICO, Gallup.—Attorney-General W. C. Reid has granted permission for the use of the name of the Territory in quo warranto proceedings against the municipal officers of Gallup as the result of the recent election muddle. He says "in the case of Gallup it is very questionable whether the present officials of that municipality are even de facto officers. I am not presuming to decide this question for the people of

Gallup when I grant permission to institute quo warranto proceedings, but it is enough that there is a question, and the court is the proper tribunal to determine."

NEW YORK, Buffalo.—The grade-crossings commissioners have adopted plans for the abolishment of about 50 grade crossings. Modified plans for some already passed on were adopted. Most of the crossings that are to be abolished lie between Black Rock and Elk street on the north and east line of the city.

Schenectady.—Special clerks acting under instructions of Commissioner Daniel G. Vedeler have found that the municipality has been losing large sums in water rents. It is estimated that increased water taxes amounting to \$17,000 will accrue to the city.

NORTH CAROLINA, Wilmington.—State Chemist B. W. Kilgore has just completed an analysis of a sample of the City Hall water and has pronounced it safe drinking water. The analysis in detail is as follows: Total solid matter in solution and suspension, 10.83 grains per U. S. gallon; hardness, 8.6 degrees Clark's scale; equivalent to calcium carbonate, 7.9 grains per U. S. gallon; chlorine, 0.68 grains per U. S. gallon; free ammonia, .001 parts per million; albuminoid ammonia, 0.01 parts per million; nitrogen as nitrates, 0.05 parts per million.

NORTH DAKOTA, Bowbells.—The city at the present time is without fire protection and it is only a miracle that a disastrous blaze has not resulted. The sewerage is something it would be folly to do without any longer, as all the cellars and basements under the business buildings are at all times cesspools of filth from stagnant waters.

OHIO, Massillon.—Work has commenced at the sewerage beds under the direction of Mr. Shutes, of a firm of Columbus sanitary engineers. Three feet of earth will have to be removed from five acres of ground where filtering will be done.

OKLAHOMA, Burlington.—This town is on the new extension of the Denver, Enid and Gulf road and is situated about ten miles south of Kiowa, Kan., in a very fertile section of Woods county. It is already quite a town, though only two weeks old. It has two banks, the lumber yards, two stores, three elevators and several other enterprises.

OREGON, Portland.—Evidence of what the police believe to be a daring plot to blow up the vaults at the City Hall and rob the City Treasury has come to the hands of the police authorities. Upon the orders of Acting Chief Gritzmacher, a special detail of patrolmen guards the City Treasury, and other special details will continue to guard it until all danger is past.

PENNSYLVANIA, Harrisburg.—New buildings erected in the heart of the city have telephone and electric-light wires entering from underground conduits.

RHODE ISLAND, Providence.—City Engineer Fisher, of Rochester, and Consulting Engineer Emil Kauschling, formerly Chief of the Rochester Waterworks, visited the City Hall recently and after consultation with Dr. King, the acting Superintendent of Health, accompanied City Engineer Clapp to the filtration plant at Field's Point. There the party inspected the entire plant and expressed themselves as being greatly pleased with its condition. The city of Rochester contemplates the establishment of a similar plant, and it was for the purpose of getting an insight into the operation that the visit was made to this city.

SOUTH CAROLINA, Columbia.—At an early meeting of the Council, Alderman DePre will intro-

duce an important ordinance creating the office of inspector of milk, dairies, food, provisions and water, and providing for the inspection of all places where eatables or drinkables are sold.

SOUTH DAKOTA, Irene.—The sentiment of a meeting of citizens held at the request of an engineer of the Illinois Central, who desired an expression of opinion in regard to the road entering this city, was that Irene did not want the road, as it would divert trade from its best territory, but it was finally decided to make the best of the situation, and the meeting voted for the road to locate a depot in the town.

TENNESSEE, Chattanooga.—Mayor Frierson has just introduced an innovation, a contract system for the collection of the city's back tax revenues. Heretofore the state revenue agent has been performing the function of such collector for the city, reporting only at his pleasure to the City Treasurer.

TEXAS, Dallas.—Forty-seven men are engaged in the sanitary and street cleaning departments of the city. The comparatively small number of men have to work over a large territory and must traverse as often as possible, in one way or another, the 300 miles of the city's streets. It is the effort of the department to keep the paved streets in the business section of the city thoroughly sprinkled, and at least once a day all of the paved and macadamized thoroughfares in all parts of the city.

Terrell.—A controversy has arisen in this city over Mayor Pro Tem. W. P. Allen vetoing the action of the City Council at a recent meeting, which ordered an election to be held to determine whether or not the city of Terrell would establish a lighting plant. The matter has been submitted to the Attorney-General and his opinion rules that the Mayor Pro Tem. could not veto the action of the Council when the Mayor was absent from the city temporarily. The election has been ordered and will be held in August.

UTAH, Logan.—The city tax levy for 1906 has been fixed as follows: Contingent expenses, 5 mills; streets and bridges, 3 mills; waterworks extension, 2 mills; interest on electric light bonds, 3-10 mill; total, 10 3-10 mills. This is a reduction of 2½ mills from last year's levy, which was 28-10 mills. The reduction is based upon the earnings of the city electric-light plant, which amount to approximately \$6,000 a year, according to the Mayor's report. This earning capacity is based upon twenty-cent lights, but in order to meet the competition of the Telluride Company, it is intended to cut the price of lights to ten cents each per month. At that price it is estimated the plant will pay operating expenses only.

VERMONT, Burlington.—At a public meeting the resolution to authorize bonding for \$75,000 to install a plant to filter water from Lake Champlain for city use was dismissed. A committee was appointed to investigate pollution of the lake and another committee was appointed to confer with the State Board of Health, which has ordered all faucets in the city to be labeled "Dangerous: Boil before using."

VIRGINIA, Norfolk.—The Council, on recommendation of H. B. Goodridge, Chairman of the Jamestown Exposition Boulevard Commission, at its August meeting, voted \$100,000 as the city's share of the proposed boulevard from Norfolk to the Jamestown exposition. It developed during discussion on the measure that with the \$100,000, the bonded indebtedness of the city will be \$563,000, leaving only \$375,000 available for further bond issues.

Richmond.—Three months ago Richmond decided to rehabilitate and rebuild her gasworks, but the city is still struggling with the problem how to carry out that intention. The question of selecting a gas engineer of established reputation as a consulting expert is being considered.

WASHINGTON, Seattle.—Members of the City Council and a committee representing the King County Medical Society have agreed to leave the question of the danger of polluting the Cedar river water supply, if the St. Paul Railroad builds down that stream, to Dr. Sedgwick and Professor Abbott, of the University of Pennsylvania. Dr. Sedgwick will make the investigation on behalf of the Council and Professor Abbott for the physicians. If Professor Abbott will not come West another authority will be invited. If the two cannot agree upon a report a third man will be secured. At a later meeting, without the conference of the physicians, the City Council decided to recommend a third member of the Commission, naming Professor Harrington, Secretary of the Massachusetts State Board of Health and Professor of Hygiene, at Harvard.

WEST VIRGINIA, New Cumberland.—Since the breaking of the gentlemen's agreement among the sewer pipe manufacturers of the United States it is asserted among the independent manufacturers of the Ohio valley that the only thing now to do to uphold prices and have harmony in the trade is to form a company on lines similar to those upon which the United States Steel Corporation was formed and secure control of every sewer pipe plant in the country. President McKee, of the Duquesne Fireproofing Company, of Pittsburg, has taken the initiative in this respect and asserts that his company is ready. The American Sewer Pipe Company controls thirty-six plants and there are about twenty-five independent plants in the country to be taken up under this plan.

WISCONSIN, Bayfield.—The first municipal electric-light plant in Wisconsin was established at Bayfield in 1889, five years after the electric lighting was begun in the State. At that time there were thirty private plants in operation. The latest figures show forty-six municipal and 123 private plants in the State, indicating a growth of municipal ownership in the past seventeen years from one-thirtieth to one-third of all plants in the State. Of the 123 private plants, thirty-eight are in places of less than 1,000 population. The cities and villages of the State having municipal plants are as follows: Bayfield, Columbus, Fort Atkinson, Marshfield, Mazomaule, New London, Oconomowoc, Plymouth, Reedsburg, Stoughton, Two Rivers, Algoma, Arcadia, Narron, Black River Falls, Blair, Blanchardville, Boscobel, Cedarburg, Clintonville, Elroy, Colby, Cumberland, Elkhorn, Evansville, Fennimore, Florence, Grantsburg, Rice Lake, Greenwood, Independence, Hudson, Jefferson, Kilbourn, Monticello, New Glarus, Princeton, Richland Center, River Falls, Sauk City, Shawano, Spring Green, Sturgeon Bay, Thorp, Whitehall, Waupun.

WYOMING, Shoshone.—C. E. Freeman, a civil engineer, sent out to make a survey of the proposed irrigation canal routes in the Shoshone Indian reservation by a firm of Chicago contractors, who may make a bid for the digging, expressed the opinion that by starting a ditch at a higher point up the river, the canal would have a greater fall than otherwise, thus producing considerable power, which could be utilized for electric lighting, heating and manufacturing purposes in the towns which will spring up along its course.

CANADA, St. Thomas.—The city owns its electric car line, power and light system, its gas plant, waterworks and all public utilities. All have benefited greatly in consequence. It is a city without a trust of any description. In connection with the car line there is a large and beautiful park.

Sarnia.—The last section of the new waterworks intake pipe, which is being put down in the river by Mr. John Gibb, of Wallaceburg, has been laid.

Winnipeg.—The city will be on the ragged edge of a water famine for the next six months. Mr. J. C. Gibson, Chairman of the Fire, Water and Light Committee, said recently: "I don't want to be an alarmist and am not stating anything but the exact condition of the water supply. We have much more water to-day than we had some months ago, but the great growth of the city is making it almost impossible to meet the demand. With all our wells running we can't keep up the pressure and there is no hope for a higher pressure for at least six months, when well No. 4 can be operated. At present the 6,000,000 gallon reservoir, which is supposed to be kept full in case of a fire, is at present only partly full owing to the demand for water in the city. The new well is yielding 1,500,000 gallons a day, according to the City Engineer; which comes up to the expectation of the authorities."

Ottawa.—General Counsel Frederick W. Stevens, of the Pere Marquette railway, has received word from the Canadian attorney of the road that the private Council of England has sustained the ruling of the Canadian high court which ordered the deportation some time ago, under the Canadian alien labor act of several American officials of the road, who were employed at the division headquarters in St. Thomas, Ontario. The decision will not affect the Pere Marquette any, as the road has moved its division headquarters from St. Thomas to Detroit since the appeal was taken, but is important as definitely establishing the right of a Canadian to prevent American citizens from working in the dominion. Officials along the border here, however, say that they do not anticipate any concerted effort by Canada to enforce this law.

HAWAIIAN ISLANDS, Honolulu.—H. C. Kellogg, the engineering expert, who has been making an examination of the dam in course of construction in the upper part of the Nuuanu valley, as a part in the Honolulu waterworks system, has completed his work. It is believed that he will make recommendation of important changes in the plan and construction of the dam.

PANAMA, Gatun.—A site for the town has been surveyed, and the rough estimate of the cost of the mammoth dam—the greatest on earth—to be constructed at that point has been put at \$50,000,000. Gatun is only seven miles from Colon, and the latter town will profit by the big labor expenditure to be made at the dam site.

Pedro Miguel.—Pedro Miguel will be the boom town on the Pacific end of the zone. Here will be laid out new machine shops, hotels and residences. Pedro Miguel will profit by the erection of the big dam and locks in Minaflores. Great railroad yards are now about completed and dirt and stone from Culebra cut will be taken by the Panama Railroad engines at Pedro Miguel to be dumped at the Minaflores dam.

A Cliplet

I want to be the iceman,
And with the iceman stand;
An auto at the sidewalk,
A bankbook in my hand.—*Exchange.*

Personals

ALLEN, R. E., Mayor of Augusta, Ga., will be unable to attend the annual meeting of the League of American Municipalities at Chicago next month as delegate from the Georgia League, and Mayor Bridges Smith, of Macon, has been tendered the honor.

BARTZEN, PETER, Building Commissioner, of Chicago, Ill., has secured a victory against billboards by an order of the court, and the signs which adorn the sky line on all sides of City Hall square must come down.

BECKWITH, E. R., has been appointed City Engineer of Ottawa, Canada.

BLACK, FINGAL CONWAY, Professor at the Indiana Normal University and College of Applied Science, Muncie, Ind., has accepted the Chair of Highway Engineering, a department of Civil Engineering, in the Rhode Island College of Agriculture and Mechanic Arts, Woonsocket, R. I.

BUCKINGHAM, J. M., Health Officer of Springfield, Ill., advocates the systematic collection of garbage by the passage of an ordinance requiring citizens to secure cans that may be emptied on certain days by collectors who now perform the duty only on call.

COLEMAN, JOHN S., Superintendent of Waterworks, Dunkirk, with a committee of the Board of Water Commissioners, consisting of Messrs. Flahaven, Bartlett, and Wille, recently visited Erie, Pa., and other places where engines and boilers are manufactured, with a view to the purchase of a 600-horsepower engine and a 400-kilowatt generator, directly connected.

CROSBY, W. W., Road Engineer of Maryland and Dr. Richard S. Hill, author of the Legislative bill appropriating \$9,000 for the construction of a highway between Baltimore, Md., and Washington, D. C., have held several conferences as to the manner in which the money is to be expended.

ECKERSON, C. H., of Englewood, N. J., is engineer for the sewer system to be constructed at Irvington, N. J., having been selected by Mayor Daniel W. McAvoy.

ERICSSON, JOHN, formerly Chief Engineer of Chicago, Ill., has been appointed as representative of the city in the lowering of the tunnels under the Chicago river by the Union Traction Company.

GREAVES, A. C., City Engineer of Spencer, Iowa, has resigned to accept a similar position at Sturgeon Bay, Wis.

HARDEE, CAPT. WILLIAM J., City Engineer of New Orleans, La., has succeeded in completing the construction and equipment of the asphalt repair plant, and Mayor Behrman, and Chairman Frawley, of the Council Budget Committee, are well pleased with the new addition to the municipally owned departments.

JACKSON, GRANBERRY, of Nashville, Tenn., Civil Engineer, who is connected with Vanderbilt University, has been engaged to superintend the installation of the sewer system of Nashville, Tenn., by the Sewerage Board, of which J. H. Flippin is Chairman, and E. H. McFadden, is Secretary.

MCGRAW, JAMES, has been appointed Chief of the Fire Department at the Northern Illinois Hospital for the Insane at Elgin.

POTTER, CHARLES, L., Major U. S. Engineers, who has been placed in charge of the Third Lighthouse District, with headquarters at Staten Island, N. Y., was tendered a banquet at St. Paul, Minn., by the office force of the Lake Superior District. Major G. D. Fitch, his successor as engineer officer at that post, was one of the guests.

SHEA, JEREMIAH, the granite expert of Granite, Okla., in speaking for "Greater Wichita" at Wichita, Kan., advocated red granite, instead of brick, for house fronts, and said "there is enough granite on the level prairies of Oklahoma to build all the cities in Kansas a dozen times over, not to mention the amount of it that is beneath the surface of the ground."

TRAINOR, WILLIAM, a member of the Boston, Mass., police force, recently distinguished himself by rescuing three persons from a burning apartment house of the fashionable Back Bay district of the Hub.

WEAVER, JOHN, Mayor of Philadelphia, Pa., who has successfully breasted the waves of a turbulent political sea, is now taking swimming lessons, Prof. William F. Hoffman, of the Philadelphia Swimming Club of Lafayette, being his instructor.

Some Unusual Fires

ALBANY, N. Y.—Flour storage warehouse of Henry Russel, said to be the largest structure of its kind in the world, burned, August 3. Cause unknown. Damage, \$300,000.

GREENSBORO, IND.—The Town Hall burned, August 4. Cause unknown. Damage, \$2,500.

HOWARD, OHIO.—Business part of town, including all food supplies, burned, August 2. Cause, incendiary. Damage, \$25,000.

RED BLUFF, CAL.—The home of the Chief of the Fire Department, Henry C. Wietfeldt, burned, July 23. Defective signal system turned in wrong alarm. Cause, defective flue. Damage, \$1,200.

POTTSVILLE, PA.—West Pine Knot colliery of the Reading Coal and Iron Co., burned, August 5. Heat of sun caused spontaneous combustion. Damage, \$125,000.

SHELDON, MO.—Buildings in business section of town burned, July 31. Cause unknown. Damage, \$200,000.

NOTES—QUERIES—
CORRESPONDENCE

Editor MUNICIPAL JOURNAL AND ENGINEER,

Flatiron Building, New York City.

DEAR SIR:—Your editorial of July 4th issue—an appropriate date for your commendable call to public duty in the higher patriotism, of every community having such a regard for neighbors as not to defile their water supplies—contains a statement that will serve as a text for this letter. You say, regarding waste water: "Perfectly pure is, of course, impossible." If this refers to chemically pure, your premises are well taken; but if, as undoubtedly intended, naturally pure, the equivalent of the best spring water, the statement is as ill-founded as claims in the past of many things being impossible that are now practical, every-day facts in wide fulfillment. After the introduction of wireless telegraphy, x-ray photography and many other wonders, is it wise for anybody to say that the simpler thing of polluted water being completely purified is an impossibility? Especially since it can be done in laboratory test by any chemist and the principles of oxidation by which it is done are well recognized and widely known as being everywhere at hand, it simply being a problem of proper adaptation and with economy. Hence it remains only to encourage improvements in the line of applying oxygen to accomplish the ideal purification of both sewage and water supplies.

The ever-increasing congestion of population both augments the demand for more pure water, and lessens the amount of it obtainable by increasing pollution. This can not continue indefinitely. Public opinion will oblige the courts to enforce the laws for health and financial reasons, and thus compel the absolute purification to stand the test of law. Many cities will act soon for cash reasons, if for no other, as they will be involved in litigation that will cost them vast sums of money. Paterson, N. J., is an instance of a city having suits for pollution against it for an aggregate of over a million dollars, and it is pay this or purify the sewage—if not both. The courts in the future will uphold the common-law decisions recently made in England, which are legal precedents for us—that neither down stream or ocean pollution anywhere is permissible.

There are various reasons why more progress has not been made; one is the entire reliance on engineers who are committed to theories and unwilling to do or permit anything but the following of precedents already proven ineffectual methods, which, however, are simply tolerated for the present by State authorities. Since the purification of water is *per se* a chemical problem, the advisor for any kind of water purification should be primarily a chemist and capable of understanding the basic principles.

First, as to filtration—which is useless unless it takes out a large quantity of polluting matter, and if it does do so is undesirable if it retains the polluting accumulation, as it offers the ideal conditions of darkness, moisture and warmth to increase the sanitary dangers by harmful bacteria growth—unless the filter can be completely sterilized continuously.

Additionally, it may be noted that the best scientific authorities, such as Pasteur, Koch, and U. S. Surgeon-General Sternberg, have established the fact that it is impossible to devise a filter that will allow water to pass through it that will not at the same time permit the passage of pathogenic bacteria. Further, the use of the septic system in sewage treatment is the opposite of purification, for it is the employment of putrefaction or the dangerous bacteria culture, and is condemned as unsanitary by the Royal British Sewage Disposal Commission.

As the United States government ascertained when it was necessary to settle the question, the way to resume specie payments was to resume; so the way to purify polluted water is to apply directly the most efficient means of purification known.

Hitherto, seemingly, it has been the endeavor to try how not to obtain the best plan of purification by the custom of employing a consulting engineer given *carte blanche*, without any responsibility as to results; there was no encouragement for him to do anything but follow his own bias and precedents. But, let a municipality afford wide-open competition for plans, as well as doing the building, as in this undertaking the principles employed are of more importance in fact than the quality of the construction work, or of equal importance at least.

Hitherto, engineers never even risked their fees, therefore let the contracts be let for bids for any plans that contractors will erect and put in operation, and be judged by actual results shown, contingent upon payment or fulfillment of a sufficient surety bond. Under this course engineers will be just as necessary, but contractors will be employed in a way where they will have a business interest in accomplishing successful results.

Thus encouragement is given for development of new methods, now shut out by engineers for reasons of their own, to the detriment of the municipality.

Yours truly,

F. N.

ADVANCE AND WEEKLY CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Buildings, Bridges and Street Railways—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

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STREET IMPROVEMENTS

Marion, Ind.—A petition has been filed for cement walks on Wabash avenue.—Address Board of Public Works or City Clerk.

Topeka, Kan.—An issue of \$131,262 bonds for paving and refunding purposes has been authorized; they have been purchased by Well, Roth & Co., Cincinnati, O.

Covington, Ky.—Bids were opened, August 13, for \$4,190 5 per cent. street improvement bonds.—John J. Craig, City Clerk.

Yale, Mich.—The proposition to issue \$14,000 cement sidewalk bonds carried.

Bellaire, O.—Bids will be opened, September 4, for \$3,673.40 6 per cent. street improvement bonds.—P. E. Crow, Comptroller.

Bluffton, O.—Council has sold bonds for the Main and Church street paving to the Commercial bank.

Canton, O.—Bids will be received, August 27, for \$1,400 street improvement bonds.—Armstrong Ashbrook, City Clerk.

Cincinnati, O.—Bonds, \$300,000 have been authorized for the Liberty street viaduct.

Coshocton, O.—Bids were received, August 13, for \$26,500 4½ per cent. street improvement bonds.—Charles Smith, Auditor.

East Liverpool, O.—The estimate for paving Fifteenth street is \$7,000.

Findlay, O.—The bidders on paving of East and West Lincoln streets are C. B. Hall & Son and C. B. Metcalf, Findlay; Baldwin Brothers & Graham, Cleveland, and G. H. Hefner & Son, Selma.

Hamilton, O.—Bids will be received, August 16, for \$55,000 4 per cent 15-year street improvement bonds.

Massillon, O.—Bonds, \$1,400, have been issued for stone and cement sidewalks.

Piqua, O.—Bids will be opened, August 31, for \$30,000 4 per cent. 10-year bonds for repaving certain streets.—Bert A. Reed, City Auditor.

Portsmouth, O.—Bonds, \$4,000, have been issued for improving Lincoln street, \$9,000 for Sixth street, and \$4,500 for Campbell avenue.

Sandusky, O.—An ordinance has been passed authorizing issue of \$5,000 paving bonds.—Charles E. Stoud.

Toledo, O.—Bids for \$180,000 street improvement bonds have been rejected; they will be readvertised.

Xenia, O.—Bids will be received, August 20, for \$49,500 4 per cent street improvement bonds.—C. F. Logan, City Auditor.

Youngstown, O.—Bids were opened, August 6, for \$17,000 street improvement bonds, \$4,865 sidewalk bonds, \$8,700 Market street paving bonds and \$9,350 Chalmer avenue paving bonds.—W. I. Davis, City Auditor.

Youngstown, O.—Bonds, \$8,000, have been issued for paving and sewerage.

PROPOSED WORK

Peoria (Averyville), Ill.—Portions of Vine street are to be paved.—Board of Public Improvements.

Pontiac, Ill.—Arrangements are being made to let another large contract for constructing cement walks.

Indianapolis, Ind.—Leonard street and Bellevue avenue will be improved by grading, cement walks, etc.; a local sewer will be laid in Walnut street.—Board of Public Works.

Vicksburg, Miss.—The Council Paving Committee has adopted plans and specifications for paving; a resolution was also passed for a sewerage system.

Barberton, O.—High street property owners have asked that the thoroughfare be paved, and Council will take immediate action.

Canal Dover, O.—Property owners on Wooster avenue are taking steps looking to the paving of that street in the fall.

Cincinnati, O.—Council has passed ordinances authorizing the resurfacing with asphalt of Scott, Fourth and Pike streets.

Hamilton, O.—The cost of laying sheet asphalt on Fourth street is estimated at \$26,000.—L. A. Dillon, Engineer.

Port Clinton, O.—Council has decided to pave East Market street with brick.

St. Clairsville, O.—An ordinance has passed for improving Main street by paving with brick, curbing, etc.—John Nichols, Clerk.

Steubenville, O.—Council has decided to improve Lincoln avenue and construct a stone wall in that section; no action has been taken on paving Lake Erie avenue.

Toledo, O.—Estimates are being prepared for bids on \$50,000 worth of delinquent sidewalk contracts.—Sidewalk Inspector Hune.

Youngstown, O.—Residents of Ford Burk streets have petitioned for paving thoroughfares with brick.

Youngstown, O.—Council has passed ordinances for paving Oakhill avenue and Grant street.

Uniontown, Pa.—Bonds, \$130,000, have been issued for street improvements and municipal buildings.

CONTRACTS TO BE AWARDED

Champaign, Ill.—Bids were received, August 6, for improving certain streets, according to plans and specifications; about 1,800 square yards of brick pavement are required.—Shields A. Blaine, President of the Board.

Chicago, Ill.—Bids were received, August 14, for improving portions of Chase avenue by curbing, paving with macadam and laying concrete sidewalks, according to plans and specifications.—William L. O'Connell, Commissioner of Public Works.

Danville, Ill.—Bids will be received, August 20, for constructing brick pavement on the Batestown road.—E. M. Briley, Town Clerk.

Decatur, Ill.—Bids were opened, August 7, for improving certain streets with cement curbing and asphalt paving.—A. B. Alexander, Engineer.

Indianapolis, Ind.—Bids were received, August 13, for paving Illinois street.—Board of Public Works.

Iowa City, Ia.—Bids were received, August 10, for paving and curbing portions of Bloomington and Jefferson streets.—H. F. Dondone, City Clerk.

Akron, O.—Bids were opened, August 4, for curbing and paving Prospect street.—C. H. Watters, Secretary, Board of Public Service.

Bellevue, O.—Bids were opened, August 14, for grading and paving Monroe and Sandusky streets.—George Lieber, City Clerk.

Cleveland, O.—Bids will be received, August 17, for paving with Medina stone on concrete foundation certain portions of Clark avenue, according to plans and specifications.—A. R. Callow, Secretary.

Cleveland, O.—Bids will be received, August 16, for paving certain drives in Gordon Park with macadam; estimated cost, \$17,000.

—A. R. Callow, Secretary, Board of Public Service.

Cleveland, O.—Bids will be received, August 15, for improving portions of Twenty-third street by curbing, paving with brick, etc.—A. R. Callow, Board of Public Service.

Mingo Junction, O.—Bids were opened, August 8, for improving certain streets by grading, curbing and paving with brick.—Frank McLister, Clerk.

Mt. Vernon, O.—Bids will be opened, August 15, for paving East High street, East Vine street, West High street and Sandusky street; work will require 36,000 yards of excavation, 120,000 square yards of paving, seven miles of straight curbing, two miles of header curbing and half a mile of corner curbing.—E. M. Parmenter, Clerk.

Norwalk, O.—The contract for paving Benedict avenue and East Main street will probably be awarded the Canton Hollow Brick Company.

Pleasant Ridge, O.—Bids were opened, August 7, for macadamizing, curbing and constructing culverts and cross-walks.—W. C. Davis, Clerk.

Beloit, Wis.—Bids will be received, September 1, for paving with vitrified brick portions of several streets.—R. D. Treadway, Chairman, Board of Public Works.

Green Bay, Wis.—Bids were opened, August 13, for improving streets with macadam pavement and Portland cement combined curb and gutter.—George Stinger, Clerk, Committee on Buildings and Streets.

Kenosha, Wis.—Bids will be opened, August 17, for paving several streets with brick.—James Gorman, Chairman, Street Assessment Committee.

Milwaukee, Wis.—Bids were received, August 10, for constructing cement sidewalks on portions of Eagan avenue.—Charles J. Poetsch, Commissioner.

CONTRACTS AWARDED

Waterbury, Conn.—Warren Brothers Company, Boston, Mass., have been awarded additional contracts for 15,400 square yards of bitulithic.

Wichita, Kan.—The Kansas Bitulithic Company, Kansas City, Mo., has been awarded contract for 19,365 square yards of bitulithic.

Newport, Ky.—F. L. McLane & Sons have been awarded the contract for improving Eleventh street, at \$7,940.

Detroit, Mich.—The Central Bitulithic Company has the contract to pave First street, for \$10,500; James Hanley will pave Ferry street with cedar block for \$18,000; T. E. Curry, Agney street with cedar blocks for \$6,400; W. W. Hatch & Sons, Trombley street with brick for \$9,400, and Lannan Brothers, Howard street for \$11,000.

Akron, O.—McShaffrey & Son are low bidders on Akron brick for paving Long street, at \$9,400; Barnett & O'Marr are low on Canton brick, at \$10,000.

Bluffin, O.—A. J. Bogart & Co., of Columbus Grove, have been awarded the \$50,000 paving contract; work will start at once.

Hamilton, O.—The Andrews Asphalt Paving Company has the contract for improving Dayton street, at \$35,681.

Hamilton, O.—Thomas Bridges' Sons Company have the contract for paving Henry street with Logan block, at \$2,600; the W. N. Andrews Asphalt Paving Company will pave South Fourth street for \$19,758.

Norwalk, O.—W. S. Hadley, of Canton, has the contract for paving both sections of Benedict avenue and East Main street, at \$20,000.

Painesville, O.—Baldwin Brothers & Graham, of Cleveland, and the Hanlon Construction Company, of Cleveland, are low bidders on paving and sewer contracts; the former will pave East Erie street and the latter Mentor avenue; curbing will be similar to that on the St. Clair street work and the brick similar to that furnished by the Collinwood Brick Company; the filler will be of concrete.

ROADS

Haverhill, Mass.—The Lawrence road is to be extended to Methuen line; estimated cost, \$16,000.—Address Massachusetts Highway Commissioners, Boston, Mass.

Lancaster, Minn.—The question of issuing bonds for road improvements will be submitted to a vote.

Delaware, O.—Bids will be opened, August 27, for constructing the Galina and Bennett Corner road, a mile in length.—E. S. Mendenhall, County Surveyor.

Delaware, O.—Bids will be opened, August 28, for constructing the Galena and Johnny-cake Corners road, one mile long; also the Galena Public Square road, in Berkshire township, 550 feet long.—E. S. Mendenhall, County Surveyor.

Napoleon, O.—Bids were received, August 14, for \$26,000 Henry County road improvement bonds.—F. J. Deek, County Auditor.

Wilkesbarre, Pa.—Bids will be received, August 20, for constructing a macadam road from Hillside to Huntsville, in Jackson township.

Oconomowoc, Wis.—The citizens have voted \$12,000 bonds for country roads.

SEWERAGE

Dubuque, Ia.—Council has granted petition for sewer between Queen street and Windsor avenue.

Bellevue, Ky.—Arrangements have been made to issue \$60,000 bonds for a sewer system.

Monroe, Mich.—The city will have a new and complete sewer system, separate from the present system; estimated cost, \$125,000 to \$150,000.

Cleveland, O.—Council has authorized expenditure of \$60,000 to construct a sewer in Highland avenue, between the lake and Madison avenue; also \$2,500 to construct an extension of Marquette street sewer.—A. R. Callow, Secretary, Board of Public Service.

Conneaut, O.—All bids for the new sewer work have been rejected; George Marsh was low bidder, at \$11,000; they will be readvertised.

Fostoria, O.—Bids will be opened, September 1, for \$7,000, 4 per cent. bonds, for constructing storm water sewers.—J. T. Fant, City Auditor.

Sandusky, O.—An appropriation of \$50,000 has been asked to construct the Warren street sewer; plans have been approved.—Board of Public Service.

Erie, Pa.—A bonding proposition will be submitted to the people for constructing a large intercepting sewer.—R. J. Saltsman, Mayor.

Morgantown, W. Va.—An election will be held, August 17, to vote on issue of \$70,000 4-1-2 per cent. sewerage and paving bonds.—H. L. Swisher, Clerk, Finance Committee.

PROPOSED WORK

Arkadelphia, Ark.—Arrangements are being made to establish a sewer system, at a cost of \$30,000.—U. G. Kaufman, City Clerk.

Little Rock, Ark.—Plans are being prepared for a septic tank sewerage plant in the southeastern section of the city.

Marion, Ind.—The City Engineer has been directed to prepare plans for a storm sewer in Gallatin street.

Dubuque, Ia.—Council proposes to construct a large number of sewers of various sizes.

Junction City, Kan.—Council has decided to establish a sewer system, at a cost of \$50,000.

Grand Haven, Mich.—The citizens have voted to issue \$60,000 bonds for constructing a sewerage system; contracts will be let at once.

Two Harbors, Minn.—Sewers are to be constructed in a number of streets; estimated cost, \$14,000.—Address City Clerk.

Lancaster, N. Y.—Plans and specifications have been completed for the sewer system; estimated cost, \$200,000.

Cincinnati (Lockland), O.—Lockland Council has authorized construction of extensive sewer system.—Address Town Clerk.

Cleveland, O.—Council has passed ordinance for constructing an intercepting sewer in Breakwater avenue; estimate, \$25,000.—A. R. Callow, Secretary, Board of Public Service.

Conneaut, O.—Bids are invited for constructing 8,000 feet of sewer in District No. 4.—T. F. Linniger, City Engineer.

Marietta, O.—Council has passed ordinance to construct a sanitary sewer east of Sixth street; the city's share of expense will be \$4,000.—L. N. Harness, Clerk.

Niles, O.—Ordinances have been passed to construct sub-main and lateral sewers in Pearl street, one in Beaver street and another in Vienna avenue.

Youngstown, O.—Council has passed ordinance for constructing sewer, gutters and curbing in Foster street.

CONTRACTS TO BE AWARDED

Lewiston, Ida.—Bids were received, August 8, for constructing a downtown sewer system; the work includes about 1,000 feet of 6-36-inch sewers.—John E. Nickerson, City Clerk.

Wabash, Ind.—Bids were received, August 13, for constructing a sanitary sewer in certain portions of Maple street, according to plans and specifications.—Fremont McLees, City Clerk.

Claremore, I. T.—Bids were received, August 9, for constructing a sewer system; estimated cost, \$85,000.—Address City Clerk.

Bay City, Mich.—Bids were opened, August 13, for constructing 12-inch tile sewer in certain portions of John street.—C. J. Barnett, Secretary.

St. Paul, Minn.—Bids will be received, August 16, for storm water sewer in Otto avenue.—Board of Public Works.

St. Louis, Mo.—Bids will be received, August 24, for constructing sewers in certain districts, according to plans and specifications.—W. B. Dryden, Secretary, Board of Public Works.

St. Louis, Mo.—Bids were received, August 14, for constructing sewer in several different lettings; the work includes about 5,000 feet of brick and pipe sewer.—W. B. Dryden, Secretary, Board of Public Works.

Cincinnati, O.—Bids will be opened, August 27, for constructing sewers and a sewage disposal works in Lockland, according to plans and specifications.—Albert Rolef, Village Clerk.

Cleveland, O.—Bids will be received, August 16, for constructing sewers in West boulevard, according to plans and specifications.—A. R. Callow, Secretary, Board of Public Service.

Dayton, O.—The Board of Public Service will receive bids, August 17, for the southeastern storm sewer; the following material will be required: 1,875 feet 9x12-foot concrete-steel sewer, 13,125 feet concrete sewer varying in size from 7 to 81-2 feet, 1,000 feet concrete sewer 4 feet in diameter, 6,215 feet of 15-inch, 18-inch and 24-inch vitrified sewer pipe, 75,000 feet B. M. sheeting left in trench, 800 feet lead pipe, 105 manholes, 284 catch-basins, etc.—R. E. Kline, City Engineer; W. F. Miller, Clerk; T. M. Pexton, President Board of Public Service; T. J. Cellarius, Engineer.

CONTRACTS AWARDED

Duluth, Minn.—P. McDonnell has contract to construct storm sewer, at \$44,235.

Dayton, O.—Charles F. Sullivan has contract for the storm sewer in Dunkel avenue, at \$839; Fred Goehl, the sewer in Dimple avenue, at \$869, and William Hilt, the Miami boulevard sewer, at \$9,500.

Sandusky, O.—Henry Brothers are low bidders on the Warren street sewer; their bid for 2,100 feet of 54-inch circular concrete sewer was \$41,000.

WATER SUPPLY

Evansville, Ind.—The City Clerk has been directed to secure information on filtration plants in other cities, with a view to the installation of a plant.

Chickasha, I. T.—The Chickasha Water Power Company has been organized to build a dam; two horizontal tubrine water wheels, with a capacity of 500 horsepower each, will be installed.—I. E. Wetting, President; E. C. Ross, Secretary and Treasurer.

Caney, Kan.—Bids were opened, August 10, for \$30,000, 5 per cent., waterworks extension and improvement bonds.—M. E. McMillan, City Clerk.

Grand Rapids, Mich.—Bids will be opened, August 15, for \$75,000, 20-year, waterworks extension bonds.—John L. Boerr, City Clerk.

East Grand Forks, Minn.—Bids were received, August 14, for \$25,000, 5 per cent., 20-year water bonds.—James Gorman, City Recorder.

Poplarville, Miss.—The citizens have voted \$25,000 additional waterworks bonds; the Mayor and Board of Aldermen will at once take steps to secure the supply.

Neosho, Mo.—The city has voted issue of \$1,000,000 bonds for waterworks.

Williston, N. D.—Bonds, \$25,000, have been authorized for constructing a water system.

Fredericksburg, O.—Bonds will be issued for constructing a waterworks plant.

Moab, Utah.—The Moab Irrigation Company is considering proposition of the Emmitt Glacier Company to pipe water from Warmer Springs to Moab for domestic purposes.

Port Arthur, Ont., Can.—The citizens will vote on issue of \$5,000 bonds for extension of water system.

PROPOSED WORK

Denver, Col.—Arrangements are being made to extend the water mains at Highland Park and Platt river.

Moorhead, Ia.—The citizens have voted in favor of bonds for a water system.

West Branch, Ia.—The matter of establishing a water system is under consideration.

Muskegon, Mich.—The Muskegon water system is to be improved; electric pumps are to be purchased.

Cleveland, O.—An appropriation of \$4,000 has been made for the submarine cable for the Water Department.—Peter Witt, City Clerk.

Findlay, O.—The village of Follansbee will install a waterworks plant and sewerage system; Council will shortly decide which shall be built first.

Youngstown, O.—The Youngstown Land Company has bought 20 acres of land from Col. L. P. Foster, and is organizing a water company to secure a franchise and will at once commence the erection of a water plant, laying pipes, etc.—Address S. D. L. Jackson, or J. J. Boyle.

Allegheny, Pa.—Plans are being prepared for a large reservoir; the matter of building a filtering plant is being agitated.—J. Linwood Brown, Superintendent of Waterworks.

Russellville, Tenn.—The city invites bids for constructing a waterworks system, to cost about \$35,000.

CONTRACTS TO BE AWARDED

Chicago, Ill.—Bids will be received, August 17, for furnishing and erecting at the Fourteenth street pumping station, a direct-connected automatic cut-off engine and a 35 k.w. direct-connected generator, according to plans and specifications.—William L. O'Connell, Commissioner of Public Works.

Detroit, Mich.—Bids were received, August 6, for furnishing the Fire Department with 200 pieces of 6-inch cast-iron water main.—George W. Stockwell, Secretary.

Detroit, Mich.—Bids were received, August 6, for 250 Morgan gate boxes; also for 20 double disc valves.—George W. Stockwell, Secretary.

Columbus, O.—Bids will be received, August 30, for constructing a new dam across the Great Miami river, two miles above Middletown; to cost \$36,000.—State Board of Public Works.

Lancaster, O.—Bids will be opened, August 15, for extending the waterworks system; 1,600 feet of 6-inch cast-iron pipe will be required.—George Cunningham, Clerk.

Malta, O.—Bids will be received, September 14, for a water system.—Paul R. Murray, Engineer.

Sunnyside, Wash.—Bids were received, August 13, for constructing a municipal waterworks and electric-light system.—H. W. Turner, Town Clerk.

CONTRACTS AWARDED

Fayette, Ia.—Edwin Smedley, of Dubuque, has contract for extending the water system for \$7,000.

Logan, Kan.—The Des Moines Bridge and Iron Works has contract for constructing waterworks.—Burns & McDonnell, Kansas City, Engineers.

Nutley, N. J.—Thomas Hayes has contract for extending water mains through Passaic, Brookfield, Edgewood, Satterthwaite, Whitford avenue, North Road, Rutgers place, and William street, at \$8,626.

Cleveland, O.—The U. S. Cast Iron Pipe and Manufacturing Company has contract for furnishing 2,800 tons of 3 to 30-inch pipe and 120 tons of specials.

Leesburg, Va.—N. G. Phoebe has the contract for constructing a system of waterworks, at \$25,400.

PUBLIC LIGHTING

Huntsville, Ala.—The Huntsville Light and Power Company has been incorporated with a capital of \$75,000 by Charles A. Valetto, Cameron F. Roberts, and others.

Bloomington, Ill.—Council is arranging for the sale of \$40,000 bonds for improving the light and water systems.

Escanaba, Mich.—A franchise to build a \$150,000 gas plant has been petitioned for by H. C. Higgins, of Dixon, Ill.

Natchez, Miss.—Council has petitioned for authority to issue \$75,000 bonds for the electric-light plant and \$25,000 for school house.

Fremont, Neb.—Bonds, \$40,000, have been authorized for building an electric-light plant separate from the water plant.

Cleveland, O.—An ordinance has been passed authorizing issue of \$6,500 bonds for improving the municipal electric-light plant.—Peter Witt, City Clerk.

PROPOSED WORK

Edwardsville, Ill.—The Edwardsville Electric and Power Company will enlarge its power station.

Peoria, Ill.—The Peoria Gas and Electric Company will expend \$250,000 in improvements.

CONTRACTS TO BE AWARDED

Plattsburg Barracks, N. Y.—Bids were opened, August 14, for electric wiring a hospital.—Capt. Edw. T. Hartman, Quartermaster, U. S. Army.

Chillicothe, O.—Bids were received, August 14, for lighting the city.—Board of Public Service.

Cleveland, O.—Bids will be received, August 17, for furnishing and erecting at the municipal electric-light plant one condenser unit complete, ready for connection to piping.—W. J. Springborn, President, Board of Public Service; A. R. Callow, Secretary.

Oxford, O.—Bids will be opened, August 16, for engine, single phase alternating current generators, switch board transformers, and wiring for an electric-lighting plant to be erected on the campus of Miami University.—John W. Herron, President; Gustav U. Drach, Cincinnati, Engineer.

FIRE EQUIPMENT AND SUPPLIES

Kendallville, Ind.—Plans have been prepared for erecting a fire house and City Hall; contracts will be let at once.

Lawrence, Kan.—Council is considering purchase of a chemical engine.

Parsons, Kan.—Prices are invited on two poles for new fire station, 22 feet 6 inches in length and 3 inches in diameter, of brass.—George W. Gabriel, Mayor; T. B. J. Wheat, City Clerk.

Bemidji, Minn.—Council is preparing to purchase hose.

PROPOSED WORK

Chicago, Ill.—Bids are invited for the purchase of a new fire engine.—James Horan, Chief Engineer.

Lehigh, Ia.—A Fire Department has been organized; apparatus will be purchased.

Mitteneague, Mass.—A fire company is being organized; it is proposed to purchase hose and hose cart.

Negaunee, Mich.—Council proposes to purchase uniforms for the Fire Department.

Aurora, Minn.—A fire company is being organized; apparatus will be secured.

Missoula, Mont.—Council will purchase fire hose.

Canton, O.—The fire and police alarm systems will be rebuilt and re-equipped; estimates are being prepared.—Board of Public Safety.

MUNICIPAL BUILDINGS

Dixon, Ill.—An ordinance has passed for issue of \$32,000 bonds for a new City Hall.

Hindsboro, Ill.—The citizens have voted \$6,500 bonds for erecting a school house.

Indianapolis, Ind.—Bids were opened, August 3, for \$300,000 bonds for a new City Hall.

Haskell, I. T.—Bonds, \$10,000, have been voted for erecting a school house.

Wetumka, I. T.—A \$40,000 bond issue for erecting a new school building has been approved by the Secretary of the Interior.

La Cygne, Kan.—The citizens have voted \$18,000 bonds for rebuilding school house.

Salem, Mass.—Council has voted issue of \$300,000 bonds for site for a high school and building; it will be located on Highland avenue.

East Jordan, Mich.—Bonds, \$5,000, have been voted to enlarge the high school.

Taopi, Minn.—Bonds, \$5,000, have been voted for erecting a high school.

Columbus, Minn.—Council will probably authorize a bond issue for erecting a new school building and improvements to old ones.

Sugar Creek, Mo.—Bonds, \$7,000, will be issued for school purposes.

Gloucester City, N. J.—Citizens will vote on issue of \$55,000 bonds for a new high school and a primary school at a special election.

Cleveland, O.—Bonds, \$300,000, will be issued for commencing work on the City Hall.—City Hall Commission.

Findlay, O.—Council is considering an ordinance authorizing bond issue to build a school.—J. C. Edie, Clerk.

Alba, Tex.—The proposition to issue \$10,000 school bonds carried.

Grand Saline, Tex.—The Attorney General has approved an issue of \$13,000 school bonds.

Hillsboro, Tex.—Council is considering issue of \$30,000 bonds for erecting a high school.

Houston, Tex.—Bids will be received, August 16, for \$343,740 5 per cent., 40-year street bonds.—H. D. Rice, Mayor.

Manor, Tex.—An election will be held shortly to vote on issue of \$10,000 school bonds.

Temple, Tex.—The Attorney General has approved an issue of \$25,000 5 per cent. 40-year school bonds.

Huntington, Utah.—Bonds, \$10,000, have been issued for erecting a school house.

Richfield, Utah.—The city will issue \$5,500 additional school bonds.—Address Board of Education.

Cheyenne, Wyo.—Bids will be received, August 15, for \$21,000, 4 per cent., 30-year school bonds.—Albert B. Johnson, Clerk.

BRIDGES

New Orleans, La.—The City Engineer recommends that a two-track bridge, costing \$40,000, be constructed over the Bayou St. John in Esplanade street, and officials of the New Orleans Railway Company will be consulted on matter.—Messrs. O'Connor, Brandau, and Junkes, Subcommittee, Council Committee on Streets and Landings.

Grand Rapids, Mich.—Bids were received, July 30, for \$66,000 coupon bonds for building a bridge over Grand river, from Ann to Victoria street.—John L. Boer, City Clerk.

St. Paul, Minn.—Council has passed an ordinance for issue of \$100,000 bonds to aid in constructing a new bridge at Fort Snelling.

St. Louis, Mo.—It is recommended that a new four-track cantilever bridge be erected across the Mississippi at Poplar street, exclusively for railroad service, and that the city acquire the Eads bridge, and use that structure as a central public highway.—Municipal Bridge and Terminal Commission.

Cincinnati, O.—The Walnut Hill Business Club advocates the building of a viaduct at Gilbert Avenue.—Address William Walker Smith.

Columbus, O.—Numerous bridges about the city and county are in a dangerous condition, and repairs must be made promptly or some of the structures will have to be closed.

Dayton, O.—A bridge will probably be built in South Park.—Montgomery County Commissioners.

Lorain, O.—The County will shortly vote on proposition to erect additional bridges across Black river; petitions are out for bridges at South Lorain and at the center of the city.

Toledo, O.—The South street bridge over the Miami and Erie Canal is unsafe for interurban cars, and traffic has been stopped so far as the heavy cars are concerned.—Superintendent of Bridges.

Manchester, Va.—The Council is considering issue of \$28,000 bonds for a bridge at the Mayo site.

Spokane, Wash.—A movement is under way to have a bridge built across the Spokane river, to connect Brown's Addition with the North Side.—J. S. Sherwood and Patrick Shine and Councilman L. Laumer.

Marinette, Wis.—Three bridges will probably be built across the Menominee river.—Marinette County Board.

PROPOSED WORK

Rockvale, Col.—Several bridges have been taken out by the floods; new ones will be built.

Trinidad, Col.—A new bridge will be built over East Main street arroyo early in the fall, of concrete, the arch to be twelve feet across and sufficient to carry all the water that comes down the arroyo.—Las Animas County Commissioners.

Decatur, Ill.—The Wabash Company will build a double-track bridge across the Sangamon river, east of Decatur, 500 feet in length and 100 feet from center to center on the piers.

North Chicago, Ill.—Council is considering an ordinance for building a concrete bridge on Twenty-second street.

Utica, Ill.—The Illinois river bridge has been destroyed by wind; it will be rebuilt.

Iowa City, Ia.—Plans have been accepted by the Board of Supervisors for a \$4,700 concrete bridge over the Ralston on Dodge street.—A. J. Cox, County Engineer.

Washington, Ia.—Two county bridges were washed out by heavy rains; they will be rebuilt.

Topeka, Kan.—A bridge, four spans in length, each span to be 175 feet long, is to be built between Roseville and Willard; also one of seven spans, 980 feet in length, between Silver Lake and Valencia; estimated cost, \$40,000.—Shawnee County Commissioners.

Paducah, Ky.—A \$20,000 bridge is to be constructed to replace the Fourth street bridge.—Harry Hank, Chairman, Joint Public Improvement Committee.

Jackson, Miss.—A new steel bridge will be constructed over Pearl river, five miles from Jackson.—John Lorenz, Chairman of Bridge Committee.

Omaha, Neb.—Plans and specifications have been prepared for a \$20,000 steel bridge across the Burlington at Q street; the city will probably build the east approach, to cost \$3,000, and the county the west approach, to cost \$4,000.

Jamestown, O.—Council will erect a new bridge over Chadokin river, 143 feet long, 66

feet wide, consisting of two arches; cost \$20,000.—S. C. Entwistle, Member, Bridge Committee.

Timn, O.—Plans and specifications have been approved for a bridge in section 25, one mile north of the Wyandot county line, to be of the latest design, 240 feet in length; estimated cost, \$10,000.—Seneca County Commissioners.

Toledo, O.—Bridges will be built over Mud creek, and new abutments on Cherry street, Washington township, new bridge over road south of Prairie ditch and another bridge in Spencer township, and new abutments in Adams, Waterville and Providence townships.—D. G. Davies, Jr., County Auditor.

Wellsville, O.—The Council and County Commissioners propose to rebuild the bridge at Crawford.

Memphis, Tenn.—Bids are invited for county bridges on the La Grange road over Day's creek in the Twelfth District.—Address County Court.

CONTRACTS TO BE AWARDED

Mt. Gellard, O.—Bids will be opened, August 16, for constructing the superstructure and substructure of a steel bridge over Alum street, 90 feet long, with a 16-foot roadway.—W. C. McFarlane, Auditor, Morrow County.

Zanesville, O.—Bids were received, by the Muskingum County Commissioners, August 13, for erecting the superstructure of a highway bridge over the South Fork of Jonathan creek, in First street, in Roseville; also bridge in Roseville at Moody's Crossing, in accordance with plans, specifications and estimates; also for substructures.—L. E. Brelsford, County Auditor.

Fortress Monroe, Va.—Bids were received, August 11, for reconstructing bridges leading into the fort.—Capt. R. H. C. Kelton, Quartermaster, U. S. Army.

Battleford, Sask., Can.—Bids were opened, August 13, for constructing a traffic bridge over the North Saskatchewan river, according to plans and specifications.—F. J. Robertson, Deputy Commissioner of Public Works.

CONTRACTS AWARDED

Peru, Ind.—Contracts have been awarded by the Commissioners of Miami county, as follows: The Rochester Bridge Company, the Rifle bridge and the Landes bridge, the substructures being awarded Joseph Hoover and Charles Black; Charles Black, the Blackburn arch, and Joseph Hoover, the De Haven arch.

Medford, Mass.—Coleman Brothers, Boston, have been awarded contract for building concrete bridge near Armory, Mystic River Reservation, at \$28,821.

Vicksburg, Miss.—W. T. Young has been awarded contract for constructing a bridge at Haynes' Bluff, to replace an old one.—J. D. Laughlin, Clerk of the Chancery Court, Warren County.

Durham, N. C.—Austin Brothers, of Atlanta, Ga., have been awarded the contract for building an iron bridge across New Hope creek.

Defiance, O.—Schneider Brothers will build the concrete locks in the canal, for \$10,459; also the new concrete locks six miles north of St. Mary's, for \$7,000.

Philadelphia, Pa.—The contract for a steel bridge over the Rancocas creek has been awarded the New Jersey-West Virginia Bridge Company.

Providence, R. I.—The contract for constructing a tunnel through College Hill to the east side of the city has been awarded to McCabe and Biehler, of Tacoma, Wash., by the New York, New Haven and Hartford, at \$2,000,000.

Woonsocket, R. I.—The Cumberland Construction Company, of Providence, has been awarded contract to build a concrete and steel bridge over the trench on Main street, at \$4,751.—Frank H. Mills, City Engineer.

Hempstead, Tex.—The contract for a bridge over the Brazos river has been awarded the Leversedge Bridge Company, Waco.

Vernon, Tex.—The contract for constructing a steel bridge over the Pease river has been let to H. Mitchell, Weatherford, at \$30,000.

Lynden, Wash.—The Puget Sound Bridge and Dredging Company has been awarded contract for lowering the Lynden bridge, at \$3,950.

Renton, Wash.—The contract for constructing a bridge over Cedar river has been awarded the International Contracting Company, of New York, at \$11,400.

Augusta, Wis.—The contract for constructing three concrete bridges has been awarded the Hennepin Bridge Company.—Frank Foster, Engineer.

Rainy River, Ont., Can.—The contract for the steel and concrete bridge at Pithers Point has been let by the Duluth, Virginia and Winnipeg Railway Company to the Rainy River Bridge Company.

STREET RAILWAYS

Chicago, Ill.—Surveys and estimates have been completed for an electric railroad, to be known as the Chicago, Lake Shore and South Bend Railway, 70 miles long, with terminals at Hammond and South Bend.—J. G. White & Co., New York, Engineers.

Chicago, Ill.—The Carthage and Western Illinois Electric Railway Company, recently incorporated, will construct a line from Carthage, Hancock county, to points in Fulton, Cass and Adams counties.—W. M. R. Vose and F. P. Vose of Evanston, and C. C. Breuer, Ralph A. Griffin and George A. Griffin, of Chicago, Incorporators and Board of Directors.

Chicago, Ill.—The Granite City and East St. Louis Terminal Railroad Company has been incorporated, with a capital stock of \$100,000, to construct a railway from Granite City to East St. Louis.—Harry H. Phillips, Charles G. Lucas, B. H. Hurd, Paul A. Neufes and Rollo M. Cole, Incorporators.

Elgin, Ill.—The Traction Company contemplates making extensive improvements in the River street power plant.—Edwin C. Faber, General Manager.

Martinsville, Ind.—The Capital Circuit Traction Company has received a franchise to build an electric road.—J. N. Crabb, Indianapolis, President.

Muskogee, I. T.—The Muskogee Electric Traction Company will construct a new \$100,000 plant.—J. N. Ury, T. H. Martin and M. R. William, Board of Referees.

Maysville, Ky.—The stockholders of the Maysville, Carlisle, Millersburg and Paris Traction Company have decided to commence work at once.—James Kehoe, President.

Portland, Me.—The Pensacola Electric Company has been incorporated with a capital stock of \$1,300,000 to construct, operate and maintain railways operated by electricity, steam or other power.—Charles M. Drummond, President.

Boston, Mass.—The Lexington and Boston Street Railway Company has petitioned the Railway Commissioners for approval of issue of \$150,000 bonds.

Kalamazoo, Mich.—The Kalamazoo, Gulf Lake and Northern Railway Company has been incorporated, with a capital stock of \$20,000, to construct an electric line in Barry county.

Clayton, Mo.—The Hillsboro, Kimmiswich, Northern Electric Railway, has been incorporated to build a line from South St. Louis to Hillsboro.—Charles A. Gutke, President.

Addison, N. Y.—The Tuscarora Traction Company has been incorporated with a capital of \$500,000, to operate an electric road from Addison to Jasper, Steuben county, 18½ miles.—Thomas E. Harden, John M. Connelly and others, Incorporators.

Buffalo, N. Y.—Council is considering the application of the Buffalo and Lackawanna Traction Company for franchise to build a line three and a half miles long, from the city line along the Hamburg turnpike, to Clinton and Washington streets.

Geneva, N. Y.—Council has granted the Geneva, Phelps and Newark Railroad Company a franchise to build and operate an electric road through the city streets.

Cincinnati, O.—Several new traction roads, with a total mileage of 194 miles, are being planned to be built in connection with the Central Kentucky Traction Company; they will connect Lexington and Frankfort, Cincinnati and Swanton, Shelbyville and Lawrenceburg and Nicholasville and Harrodsburg, Lancaster and Danville; the Winchester line is to be extended to Mount Sterling and the Paris line to Cynthiana.

Cleveland, O.—J. W. Ogan, of Indianapolis, is promoting a \$100,000 company, which is to construct a traction line from Lima to Marion, via Kenton; nine engineers are in the field.—George Ross, Chief Engineer.

Dayton, O.—The Cincinnati, Dayton and Toledo Traction Company has been granted the right to construct a 25-foot roadway south of the lower corporation lines at West Carrollton, and two concrete arches in the same locality.—Montgomery County Commissioners.

Easton, Pa.—The Easton and South Bethlehem Transit Company has authorized an issue of \$500,000 bonds for construction.

Chattanooga, Tenn.—The Lookout Mountain Railway Company, which owns Incline No. 2, will issue \$500,000 bonds for improvements.

Nashville, Tenn.—The Nashville Railway and Light Company has voted issue of \$15,000,000 bonds for extensions and improvements and retiring other bonds.—Percy Warner, President.

Ogden, Utah.—The Ogden Short Line will construct an electric block system from Green River to Ogden.—W. H. Bancroft, Salt Lake, General Manager.

Roanoke, Va.—The Twin City Electric Company has applied for a franchise to build a line from Roanoke to Salem.

North Yakima, Wash.—The Yakima Inter-valley Traction Company has been incorporated with a capital of \$500,000.—W. A. Bell, H. B. Scudder, J. H. Dill and others, Incorporators.

MISCELLANEOUS

Annapolis, Md.—An election will be held to decide question of issuing \$25,000 improvement bonds.

Buffalo, N. Y.—The Board of Aldermen is considering issue of \$150,000 bonds for improving the Buffalo river.—City Comptroller Zimmerman.

Oxford, N. Y.—The city has voted \$4,000 bonds for school heating purposes.

Akron, O.—Bonds, \$900, are to be issued for land appropriation.—R. T. Hamlin, Clerk.

Hamilton, O.—Bids were received, July 16, for \$55,000, 4 per cent. improvement bonds.—Thad. Straub, Auditor.

Mayfield, O.—Bids were opened, August 14, for \$8,000, 5 per cent. bonds.—F. J. Wilson, Clerk, Board of Education.

Middletown, O.—Bids will be received, August 17, for \$1,584, one to ten years, 4 per cent. improvement bonds.—N. G. Oglesby, City Auditor.

Oakley, O.—An election will be held to decide question of issuing \$16,000 improvement bonds.

Painesville, O.—The river bank along South State street is to be improved by the construction of a concrete retaining wall, to be built on the rock at the bottom of the river, 16 feet high and 10 feet thick; provisions are also to be made for drainage.

Wellston, O.—Bids were received, August 6, for \$11,000, 4 per cent., improvement bonds.—J. H. Browne.

Wyoming, O.—Bids will be received, August 19, for \$17,500, 4½ per cent., improvement bonds.—Herman Duhime, Jr., Town Clerk.

Enid, Okla.—The question of issuing \$20,000 bonds will be submitted to a vote of the people.

Allegheny, Pa.—The proposition to issue \$20,000 bonds for improvement in the Twelfth ward carried.

Milwaukee, Wis.—The issue of \$50,000 natatorium bonds will be submitted to a vote at the November election.

CONTRACTS AWARDED

Washington, D. C.—A contract has been made with the General Electric Company for a steam turbine and generator for electric power, to be used in the State, War and Navy Departments.—Capt. Poole, Engineer in Charge.

Washington, D. C.—The contract for the two sea-going suction dredges to be used in the Isthmian Canal construction was awarded the Maryland Steel Company, Baltimore, at \$362,000 each.

Indianapolis, Ind.—The contract for building a retaining wall along White river in Riverside Park has been awarded the American Construction Company.

Portland, Ind.—The contract for dredging Lob ditch has been awarded Sturgeon Bros., at their bid, \$34,277.

IN THE MARKET

AT HOME

J. W. Barrett, 191 Dodge street, Cleveland, Ohio, wants a second-hand (Smith) concrete mixer.

Brengman Brothers, Mt. Airy, Ga., wants a 10-20-horsepower traction engine.

Central Carolina Construction Company, Greensboro, N. C., wants metal work for a six-story house.

P. L. Corker, Waynesboro, Ga., wants electrical equipment.

J. P. Fyffe, Keystone Building, Chattanooga, Tenn., wants gasoline lighting apparatus to illuminate a space 200 by 300 feet sufficiently for out-door performances.

J. H. Gaight, Palestine, Texas, wants metal laths and cement.

J. H. Rankin, Ashton, Idaho, wants equipment for a modern cement plant of 500 to 1,000 barrels capacity.

Roman Nose Gypsum Company, Bickford, O. T., wants a system for purifying water for steam and domestic purposes.

I. C. Smith, Wauchula, Fla., wants machinery for a 5-ton ice plant.

ABROAD

Asuncion, Paraguay.—Señor Emilio Aceval wants machinery for irrigation purposes. Address No. 26, Bureau of Manufactures, Washington, D. C.

Conception del Tio, Argentine.—Equipment is wanted for the construction of a tramway. Address No. 246, Bureau of Manufactures, Washington, D. C.

Klein-Dochtern, Holland.—Aan het Bestuur der Roomboterfabriek de Boekhorst want dairy machinery. Address No. 244, Bureau of Manufactures, Washington, D. C.

Montevideo, Uruguay.—Señor Adolpho del Campo, acting for an Argentina syndicate, wants bathing equipment. Address No. 262, Bureau of Manufactures, Washington, D. C.

Montevideo, Uruguay.—The Empresa de Luz Electrica wants equipment for electric power and lighting. Address No. 349, Bureau of Manufactures, Washington, D. C.

Santiago, Cuba.—The Compania Electrica wants equipment for wharf and tramway construction. Address No. 260, Bureau of Manufactures, Washington, D. C.

Wants

DRAUGHTSMAN wanted by metallurgical plant between New York and Philadelphia; steel, copper or lead plant experience desirable, but not essential; applicants must state age, nature of experience, references and salary to start. Address, D. T. W., Municipal Journal.

DRAUGHTSMEN—Two good power station piping draughtsmen. D. W., 121, Municipal Journal.

DRAUGHTSMAN, architectural; experienced; state salary. D. B., 236, Municipal Journal.

DRAUGHTSMAN, with long years experience in the architectural line, on church, hotel, tenement, etc.; good perspective maker. 149, Municipal Journal.

ENGINEER wants position; steady and sober; young man; reliable. M. J., Municipal Journal.

ENGINEER, 38, first class apartment house mechanic, experience and references. 402, Municipal Journal.

ENGINEER; small plant; firing, repairing, tools. W. H., Municipal Journal.

For Machines to Drill, Blast and Test Holes and Water Wells, write "LOOMIS CO., TIFFIN, O."

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A COMPENDIUM

Current Topics of Municipal Interest—
Opinions on City Affairs

Heredity and Environment as Causes of Delinquency and Crime.—In many country districts a new system has been adopted whereby all the children are carried, at the expense of the town, to larger and improved school centers, thereby securing more capable teachers and better general equipment than can be provided in the small and often sparsely settled districts. A similar method might be adopted for the overcrowded and unhealthy city slums, and the pale-faced and half-starved children—half-starved for want of food and sunlight and air, and a glimpse of nature—transported, at the public expense, into the suburbs or even into the outlying country, and their training undertaken in an environment, which, by its very contrast with the miserable surroundings of their home life, would tend to transform them from hopeless urchins into bright, decent appearing and hopeful boys and girls.—Bulletin of the American Academy of Medicine.

National Deterioration.—Everywhere I read about labor, work, national deterioration, and so on, but there is little sense in what is said. At least, that is my way of putting it. I once had a pond, and found it had a fairly large outlet and two inlets. It was carefully cleaned out, and the inlets left free. Soon it was filled with clear, pellucid water, but as time went on the water became less and less pure, till by and by it began to stink. On examination it was found that of the two inlets one admitted only pure water; the other, which only flowed periodically, admitted a very bad sample. I was told to stop up the latter inlet, and only let the former act, when the original purity would be regained. That seemed logical, and proved effective. Parliament acts differently—it lets out part of the pure and does not restrict the impure; in other words, the physically fit of our population emigrate, and so leave us, while we admit ad lib. the physically unfit from the scum of the nations.—The Contract Journal, London, England.

Greater Wilkesbarre.—Do we want a greater Wilkesbarre? This is a question that has agitated this community for a long time. We have had intermittent attacks of the fever, which a few doses of ultra-conservatism seemed to paralyze. The virus of expansion, however, has gotten into the blood of the new spirit that abounds in this community, and the question naturally resolves itself into the answer: Why should we not have a greater Wilkesbarre? The tendency of the times in our great modern American communities is to expand. Every community that has set itself strongly in the column of progress has reached out and become the greater city. Instead of being down in the census books as a city of 60,000 inhabitants, why not double that number and make it 120,000? Within five years, if we take into the Wilkesbarre family Wilkesbarre Township, Ashley, Kingston Borough, Plains, part of Plymouth Township and Luzerne Borough, we will have 130,000 to 135,000 inhabitants.—Board of Trade Journal, Wilkesbarre, Pa.

A DIRECTORY OF MUNICIPAL AND
ALLIED SOCIETIES

- August 14-16.
The Union of Canadian Municipalities.—Sixth Annual Convention, Halifax, N. S.—W. D. Lighthall, M.A., Secretary, Westmount.
- August 14-16.
National Firemen's Association.—Convention, Roanoke, Va.—O. J. McCarthy, Secretary, P. O. Box 600, St. Louis, Mo.
- August 14-16.
Nebraska State Firemen's Association.—Convention and tournament, Fremont.—E. A. Miller, Secretary, Kearney.
- August 14-17.
Western Pennsylvania Association.—Convention, McDonald, Pa.—W. H. Sharal, Secretary, Braddock.
- August 15-16.
Five County Volunteer Association.—Convention, Canton, Pa.—E. J. Cleveland, Secretary.
- August 15-17.
International Association of Municipal Electricians.—Annual meeting, New Haven, Conn.—Frank P. Foster, Secretary, Corning, N. Y.
- August 16.
New England Veteran Firemen's League.—Hand Engine Muster, Providence, R. I.—W. H. Hathaway, Secretary, Hyde Park Mass.
- August 21-22.
Interstate Firemen's Association.—Tournament, Carroll, Ia.—J. H. Post, Secretary, Carroll.
- August 21-24.
New York State Firemen's Association.—Convention, parade and tournament, Jamestown, N. Y.—Thomas Honohan, Secretary, Frankfort, N. Y.
- August 22-24.
Upper Peninsula Firemen's Association.—Tournament, Houghton, Mich.—T. J. Flynn, Secretary, Negaunee.
- August 22-24.
Virginia State Firemen's Association.—Convention, Richmond.—G. C. Cumming, Secretary, Portsmouth, Va.
- August 27.
National Civic Federation Committee, New York City.—M. E. Ingalls, Chairman.—Clinton Rogers Woodruff, Secretary, Philadelphia.
- August 28-29.
Ohio State Fire Chiefs' Association.—Convention, Cedar Point, Ohio.—D. K. Mosier, Secretary, Warren, Ohio.
- September 5.
American Society of Civil Engineers.—Next meeting, 220 West 57th street, New York.—Charles Warren Hunt, Secretary.
- September 12-14.
New England Water Works Association.—Annual convention, White Mountains.—Willard Kent, Secretary, 715 Tremont Temple, Boston, Mass.
- September 26-28.
League of American Municipalities.—Tenth annual convention, Chicago.—John MacVicar, Secretary, Des Moines, Iowa.
- September.
Municipal Civil Service Commissions of all cities in New York State.—Under auspices of State Civil Service Commission, Albany, N. Y.
- October 9.
American Society of Municipal Improvements.—Annual convention, Birmingham, Ala.—George W. Tillson, Secretary, Municipal Building, Brooklyn, N. Y.
- October 9.
West Virginia Board of Trade, Charleston.—R. B. Naylor, Secretary, Wheeling.
- October 9-12.
International Association of Fire Engineers.—Annual convention, Dallas, Tex.—Jas. McFall, Secretary, Roanoke, Va.
- October 15-19.
American Street and Interurban Railway Association.—Annual convention, Columbus, Ohio.—B. V. Swenson, Secretary, 30 Wall street, New York City.
- November 14-16.
International Congress on Tuberculosis.—New York City. (The principal purpose of the congress will be that of urging preventive legislation against tuberculosis, the adoption of municipal and government sanitariums and discussion of all the questions involved.)
- November 15.
National Society for the Protection of Public Health and Morals.—To be organized at Hudson Theatre, New York City.
- November 20-23.
Trans-Mississippi Commercial Congress.—Seventeenth Annual Session, Kansas City, Mo.—Address Board of Trade, Kansas City.

WHO'S WHO IN
MUNICIPAL WORK

ABBOTT, Alexander Crever.—Born in Baltimore, Maryland, February 26, 1860. Son of Alexander and Elizabeth Beatty Abbott. Educated in the Public Schools of Baltimore; the University of Maryland; the Johns Hopkins University; the University, and the Royal Polytechnic Institute of Bavaria at Munich, and the University of Berlin. On return from Europe was made Assistant in Bacteriology and Hygiene at the Johns Hopkins University; subsequently Assistant in Charge of the Department of Hygiene of the University of Pennsylvania; later Pepper Professor of Hygiene and Bacteriology, and Director of the Laboratory of Hygiene of the University of Pennsylvania. In 1897 was appointed Director of the Laboratory of Hygiene, Bacteriology, Disinfection, etc., of the Board of Health of Philadelphia. In 1903 was appointed Chief of the Bureau of Health and President of the Board of Health of Philadelphia, which latter position he holds, as well as the Professorship at the University of Pennsylvania. His writings have been in the fields of Bacteriology and Preventive Medicine. He is the author of two works, viz., "The Principles of Bacteriology" and "The Hygiene of Transmissible Diseases." Is a member of the Association of American Physicians, American Physiological Society, American Medical Association, American Philosophical Society, Association of American Bacteriologists and Pathologists, Society for Experimental Biology and Medicine, American Association for the Advancement of Science, American Public Health Association, Fellow of the College of Physicians of Philadelphia, and Member of the University Club, of Philadelphia. Address, 610 City Hall, Philadelphia, Pa.

HUTCHINSON, Elijah C.—State Commissioner of Public Roads, State of New Jersey; was born in Windsor, Mercer County, August 7, 1855, and is a merchant miller, also manager of the Trenton Bone Fertilizer Company. He was a member of the Assembly in 1895 and 1896. In 1898 he was elected to the State Senate. At the expiration of his term in 1901 he was again returned to the Senate, and presided over that body during the session of 1903. On January 23, 1905, Governor Stokes nominated Mr. Hutchinson to the office of State Road Commissioner, and he was at once confirmed by the Senate for a term of three years. Residence, Trenton, N. J.

WILSON, Horace.—Mayor, Wilmington, Del. Elected July 1, 1905. Born at Philadelphia, Pa., June 6, 1862. Son of J. Shields and Elizabeth M. (Engelman). Educated at public and private schools, Philadelphia. 1878 employed on tugboats, Delaware and Cape Fear rivers. 1879, clerk in office Philadelphia and Reading steam collier service. 1882, purser on Wilmington and Philadelphia route. 1885, captain steamer Brandywine. 1890, Secretary and Treasurer of company. 1900, General Manager. 1904, President. Delaware Pilot Commissioner. Port Warden, Wilmington (recently resigned). Second Vice-President National Board Steam Navigation. Second Vice-President Wilmington Board of Trade. Vice-President National Rivers and Harbors Congress. Residence, Wilmington, Del.

LEGAL DIGEST—

A Summary and Notes of
RECENT DECISIONS

Legislation on Gas Rates

Brooklyn Union Gas Co. vs. City of New York.—Held, that the fixing of a maximum rate by statute beyond which no charge shall be made by a public utility corporation, is equivalent to express authority to charge up to that rate; the test of the right of the courts to interfere with Legislative acts fixing rates of public utility corporations is whether any constitutional right of the parties affected thereby is impaired; while a rate which would result in forcing an individual or corporation engaged in a business of public utility into insolvency would be depriving him or it of property without just compensation and without due process of law, the constitutional rights of a consumer are not invaded by the fixing of a rate by the Legislature which is unreasonably high; the remedy of the consumer under such circumstances is through appeal to the legislature and not to the courts.—N. Y. Supreme Court, New York City.

Railway Transfers

Cleveland City Railway Company vs. Conner.—It is held that a passenger on a street railway who has paid fare and is entitled to ride over another line belonging to the same company, and who, having asked for a transfer over such other line, is given, by mistake of the conductor, one not good over such other line, may, nevertheless, if he has exercised such care about receiving and making use of the transfer ticket as persons of ordinary prudence are accustomed to exercise under the circumstances, lawfully insist upon being carried over such other line without further payment of fare. In such case, if the passenger, without fault on his part, is ejected from a car for refusing to pay fare other than by such transfer ticket, he may recover damages for the tort and cannot be restricted to damages for the breach of the contract to carry him. A failure by plaintiff to make a statement or explanation before he was put off the car would not of itself defeat his right to recover.—Ohio Supreme Court.

Residence of Councilman

John Doe et al vs. Fortson.—Although a municipal officer may temporarily remove his residence from the city in which he holds the office, it cannot be construed as sufficient reason for depriving him of office. The court holds that the respondent was a resident of Augusta in the Third Ward at the time of his election, and that he had his domicile there; and, further, that he had not done any act to change either his legal residence or domicile.—Georgia Supreme Court.

Waste of Natural Gas

Louisville Gas Co. vs. Kentucky Heating Co.—An injunction against drawing natural gas from a natural reservoir utilized for supplying the inhabitants of a municipal corporation, merely for the purpose of wasting it and injuring those who were utilizing it, is held to be properly granted.—Supreme Court, Louisville, Ky.

INCORPORATIONS

When our readers desire to correspond with any of the following companies, they should address the company itself or a director, incorporator or other official or partner by name to the address (if given) under such name. This will prevent letters being marked "unknown" and returned.

Barnett-Jackson Company, New York City. To manufacture cars, brick, wagons, etc. Capital, \$70,000. Incorporators: Hillary C. Messimer, Robert L. Messimer, Enslow W. Messimer, No. 56 Pine street, New York.

Belmira Asbestos Co., Portland, Maine. Asbestos of all kinds. Capital, \$1,500,000. President, L. V. Walker; treasurer, C. H. Johnston; clerk, Levi Turner, Portland, Me.

Brockton Concrete, Stone & Brick Company, Brockton, Mass. Stone, brick, etc. Capital, \$3,000. President and treasurer, Moses A. Packard, No. 647 Main street; clerk, Charles D. Pierce, No. 5 Arcade building, both of Brockton, Mass.

Central Asphalt Company, Augusta, Maine. Asphalt, cement, etc. Capital, \$350,000. President and treasurer, I. L. Fairbanks; clerk, L. A. Burleigh, both of Augusta, Me.

Colburn Machine Glass Co., 419 Market street, Camden, N. J. To manufacture glass and glass making machinery. Capital, \$500,000. Incorporators: John A. MacPeak, F. R. Hansell, George H. B. Martin, as above.

Claremont Brick and Tile Company, Biloxi, Miss. Capital, \$50,000. Incorporators: J. A. Broadus, George Cumbel and others.

East Side Heat, Light and Fuel Company, Bloomington, Ill. To furnish public utilities. Capital, \$100,000. Incorporators: John J. Pitts, Samuel R. and Ora E. White.

Herr & Raftus Co., Boston, Mass. Contractors. Capital, \$50,000. President, Peter J. Raftus, 10 Ditson street, Dorchester, Mass.; treasurer, Peter J. Herr, 217 West Second street, South Boston, Mass.; clerk, Frederic W. Lincoln, No. 331 Old South building, Boston, Mass.

Ice Company of Watertown, Watertown, N. Y. Ice. Capital, \$60,000. Incorporators: Mark S. Wilder, Carthage, N. Y.; James W. Rice, Lewis R. Washburn, De Witt C. Middleton, Frank M. Parker, Watertown, N. Y.

Illinois Hydraulic Stone and Construction Company, Elgin, Ill. Capital, \$25,000. Incorporators: C. J. Seagren, A. G. Seagren and H. A. Leach.

Lehmann Art Company, New York City. Advertising signs and devices. Capital, \$50,000. Incorporators: I. S. Thatcher, 2 West 104th street, New York; Frank H. Damock, 1 Madison avenue, New York; David Marcus Birdsall, 240 Culver avenue, Jersey City, N. J.

William T. McCarthy Company, New York City. To manufacture concrete blocks and building materials. Capital, \$60,000. Incorporators: William T. McCarthy, 1 Madison avenue; George Tumpson, 52 William street; Franklin A. Wagner, 34 Nassau street, all of New York.

Protective Hose Association, 146 Main street, Rahway, N. J. To manufacture apparatus for extinguishing fires. Capital, \$2,500. Incorporators: S. Rusling Ryno, Adolph H. Gruner, Sidney Harris, all as above.

Purity Plate Ice Company, New York City. Manufacture ice, etc. Capital, \$200,000. Incorporators: Antonio Rasines, 55 Broadway; Edward Barr, 55 Broadway; H. G. Phillips, 35 Nassau street, New York.

Taylor Engineering Company, New York City. Contracting, engineering and construction. Capital, \$600,000. Incorporators: William K. Genet, 9 Fort Washington avenue; Joseph S. Buhler, 565 West 113th street, both of New York; M. S. Ezell and Enos Ayres, East Orange, N. J.

The Tri-Color Brick Company, 185 Main avenue, Passaic, N. J. Brick building materials, etc. Capital, \$125,000. Incorporators: William F. Mertens, Joseph M. Gardner, Passaic, N. J.; Thomas M. Hurd, Paterson, N. J.

Trinity Construction Company of Dallas, Texas. Capital stock, \$10,000. Incorporators: J. P. Gilcoat, W. R. Knight and W. B. Skinner, all of Dallas.

Wells & Newton Company of New York. Manufacturing heating, ventilating and plumbing apparatus. Capital, \$70,000. Incorporators: J. Leland Wells, Amityville, N. Y.; Charles P. Newton, Mt. Kisco, N. Y.; Wilson G. Cornel, 265 Fourth avenue, New York; William H. McKiever, 218 East 20th street, New York; John A. McQuillen, 69 Park avenue, Passaic, N. J.

BOOK REVIEWS

American Street Railway Investments.—New York. McGraw Publishing Co., 1906. Cloth, 10 by 13 inches, 432 pages. The thirteenth annual edition of this work covers the field at greater length than usual, both on account of reports from new roads and more complete statements from old ones. The work contains 49 large maps showing the territory covered by 52 separate companies. Among the companies described, 51 had annual receipts exceeding \$1,000,000, the total being \$226,946,916; the revenues of 39 companies, varying from \$500,000 to \$1,000,000, amounted to \$27,507,506; 170 companies, with revenues varying from \$100,000 to \$500,000, received in all \$37,199,011; 100 companies, with revenues varying from \$50,000 to \$100,000, received a total of \$7,135,504; 77 small companies, with revenues varying from \$25,000 to \$50,000 had gross receipts of \$2,800,000. The subject is treated by States, and under the heading of each railroad are given the capital stock, funded debt, plant and equipment, parks and amusement resorts, officers, directors, general offices, power stations and repair shops. Operating reports and balance sheet, besides a history of the corporate organization of each company are given. An account of the street railways of Canada, Cuba and the United States Insular possessions is also included, and gives interesting and valuable information concerning these utilities. Supplied by the Municipal and Engineer at \$5.00 postpaid.

The A. B. C. of Parliamentary Procedure.—By William Marshall Freeman and J. Carson Abbott. London: Butterworth & Co., 1906. Flexible cloth, 5 by 8 inches, 127 pages.—The word parliamentary has a double meaning and refers to the British House of Commons or to any debating society in which there is a disposition to adhere to established rules of practice. The object of the authors of this handbook is both to explain procedure in Parliament and to simplify as much as possible a complicated subject for the convenience of public bodies or debating societies. The largest part of the book is occupied with definitions of terms some of which as "Board of Trade" apply only to British Government and others such as "motions" and "unparliamentary language" are of general use. A short Appendix A gives rules for the conduct of a local parliamentary debating society. A list of unparliamentary expressions in Appendix B is interesting and includes such obviously offensive words as "bad language" and "damnable," as well as less offensive terms, as "expert in honor," "humbug," "reverend member." The authors are not advocates of the theory that the way of saying a thing, and not the thing said, constitutes the offense. Appendix C gives the standing order of the house, the rules of which are capable of general application. Appendix D contains motions which are put without amendment or debate. Appendix E includes a specimen bill for discussion by a local parliament. Supplied by the Municipal Journal and Engineer at \$1 postpaid.

TRADE NOTES.

AMERICAN TOURS.—The Northern Pacific Railway advertises tours to the Pacific Northwest and Yellowstone Park, as well as fall rates for homeseekers and colonists.

CEMENT WORKERS' TOOLS.—The Contractors Tool Company, 764 Arch street, Philadelphia, Pa., in catalogue No. 90, illustrates and describes a full line of tools used by cement workers.

GRAPHITE PAINT.—The Detroit Graphite Company, Detroit, Mich., issue a booklet, Form Y, containing handsome illustrations of some of the buildings on which their "Superior Graphite Paint" for covering the iron work has been used.

HIGH PRESSURE FIRE SERVICE.—The Continental Asphalt Paving Company, of 42 Broadway, New York City, William G. Root, Manager, has been actively at work putting in the high pressure water service pipes on the East Side, from 23d to 9th street. The company has completed ten or twelve miles of pipe laying in three months' time and is working a force of 1,500 to 1,600 men. It is claimed that this is the largest force that has ever been employed on a pipe line in this country. When completed the pipes will be filled with Croton water. A pressure of 125 to 150 pounds will be maintained, when called for, by electric pumps at stations near the Gansevoort Market and another near the South Ferry, for a lower section. Pipe will run from these stations out into the river for use in case of a large fire.

STONE CRUSHERS.—The Austin Manufacturing Company, Manhattan Building, Chicago, Ill., issue, among other publications, a catalogue describing and illustrating their gyratory crushers, together with machinery that goes to make up a complete crushing outfit, such as elevators, screens, hoists and cars. Two vital features of the Austin crusher are the rigid eccentric bearing which is an integral part of the main frame and the double countershaft bearing. One of their specialties is a portable machine mounted on a steel frame with small wide wheels and an elevator to lift the crushed stone into wagon or bin. Illustrations and testimonials indicate that the Austin gyratory is well-known among the owners of large crushing plants throughout the country and favorable reports come back from as far away as New Zealand.

TIFFANY SLOPE.—The American Type Founders' Company, Rose and Duane streets, New York City, issue a little booklet illustrating the sizes and uses of the Tiffany slope one of the most recent of stylish types.

THE BUSINESS PHONOGRAPH.—The National Phonograph Company, Orange, N. J., issue a booklet, called the Edison Business Record, which briefly advocates the use of the phonograph for office dictation.



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PATENT CLAIMS

826,599.—Machine for Molding Building Blocks. Levi P. Normandin, Jackson, Mich., assignor to William F. Cowham, Jackson, Mich. Serial No. 265,774.

In a machine for molding blocks, the combination with a mold-bottom, of a mold side mounted to overlap the edge of said mold-bottom and vertically adjustable to extend to different heights thereabove, and a mold side hinged to said first-named mold side for the purpose described.

826,646.—System of Handling Material. Hiram W. Blaisdell, Los Angeles, Cal. Serial No. 132,326.

A system for handling material having a rotary hollow shaft, an elevator therein, a frame attached to said hollow shaft and a plurality of rotating disks carried by said frame to deliver material to said elevator.

826,719.—Timing Mechanism for Engine-Houses. James M. Gardiner, Hackensack, N. J., assignor to The Gamewell Fire Alarm Telegraph Company, New York, N. Y., a Corporation of New York. Serial No. 245,067.

The combination with a signal-circuit, and two independently-driven time-indicating connected movements, one movement being controlled by the other, and means for disconnecting the movements, the said disconnecting means being controlled by the signal-circuit.

826,777.—Building Block and Wall.—John A. Ferguson, Denver, Col. Serial No. 287,294.

A wall comprising blocks each consisting of two intersecting portions having four arms at substantially right angles to each other, each block being of a height greater than the length of any of its arms, and a facing to said wall composed of blocks having right-angled arms projecting from one side only thereof, with the arms bonded with the arms of the said blocks and their abutting ends disposed opposite the joints of the four-armed blocks.

826,845.—Safety Device for Overhead Electric Conductors. Emile Giraud, Paris, France. Serial No. 254,836.

In a safety device for overhead electric conductors, an insulator having a groove, a trough-shaped metal piece mounted in the groove for supporting the conductor, a jointed fork arranged on each side of the trough and embracing the conductor and terminating in an arm, a U-shaped piece supported by the latter, a ring fixed to the conductor on each side of the insulator and beyond the forks and having a diameter sufficient to prevent the said rings passing between the branches of the corresponding fork, substantially as described.

826,878.—Form for the Construction of Plaster and Concrete Structures. George H. Pegram, New York, N. Y. Serial No. 247,944.

In a form for constructing walls of plastic material, the combination of two walls of pliable material permeable to liquids arranged to provide a continuous space between them, and means for retaining the walls in position during the introduction and setting of the plastic material consisting of frames upon the outer surfaces of the pliable material for supporting it at intervals only and removable spacing-strips C C between the walls of the pliable material for supporting them upon their inner surfaces said spacing-strips being removable when the plastic material is sufficiently set whereby the spaces left thereby may be filled with additional plastic material.

826,890.—Street-Flushing Apparatus. Christian E. Schafer, Cleveland, Ohio, assignor of one-half to Daniel Connelly, Cleveland Heights, Ohio. Serial No. 276,388.

In combination in a street-flushing apparatus, a traveling tank and a discharge-nozzle connected therewith, the mouth of the nozzle being directed downward and forward and the outer corner of the nozzle disposed above the level of the inner corner in such manner that the water delivered from the outer corner will strike the pavement at a more acute angle than that at which the water from the inner corner will strike.

826,953.—Pumping System. Mark R. Muckle, Jr., John S. Muckle, and Thomas C. Smith, Philadelphia, Pa. Serial No. 224,590.

The combination in a pumping system, of two or more pumps, a gas-engine for each pump whereby each pump can be independently operated, an inlet for each pump, an outlet common to all the pumps, a by-pass for each pump so that one pump can be started at a time, each pump by-passing the water until it is desired to communicate with the outlet-main, substantially as described.

Proposals

Alterations to Plumbing

Albany, N. Y.

Sealed proposals, suitably endorsed on envelope, for alterations to plumbing, State Capitol, Albany, N. Y., will be received up to two o'clock in the afternoon on Wednesday, the twenty-ninth day of August, 1906, at the office of the State Superintendent of Public Buildings, in the Capitol, Albany, N. Y., when bids will be opened and read publicly.

Drawings and specifications may be consulted and blank forms of proposals obtained by application to Hon. G. L. Heins, State Architect, Capitol, Albany, N. Y.

The right is reserved to reject any and all bids.

DANIEL W. CAHILL,
Supt of Public Buildings,

S. N. Y.

Lighting of Streets

Office of the Mayor,
Anniston, Alabama, July 17, 1906.

BIDS WANTED

Sealed proposals, in duplicate, will be received at this office until 12 o'clock, noon, September 20, 1906, for furnishing a minimum of one hundred (100) electric arc lights, to be located under the direction of the Mayor and City Council, on the streets of Anniston, maintaining same and supplying current for the lighting thereof nightly until 10 o'clock p. m., and during all dark hours after said hour, for terms of ten, twenty and thirty years, beginning July 1, 1908. Consumption of electric current at the arc of said lamps must be given, and in all bids must be given a bid for lamps consuming 450 watts at the lamp terminals. The award of this contract will carry with it a franchise for the privilege of supplying electric current for all purposes to corporations and private citizens, and rates at which said current will be sold must be made a part of each proposition. A certified check on a responsible bank for one thousand (\$1,000) dollars must accompany each bid as a guarantee that a contract, under \$15,000 bond, will be entered into within thirty days after the award thereof, for the purpose of carrying out the terms of the contract. The city reserves the right to reject any and all bids.

THOMAS E. KILBY,
Mayor.

Notice to Contractors

Bids will be received at the office of the City Engineer, in the city of Paducah, Ky., up to 3 o'clock, August 25, 1906, for the construction of about seven (7) miles of combined sanitary and storm water sewers, in the city of Paducah, Ky.

Plans and specifications will be on file in the Engineer's office, in the city of Paducah, Ky., after August 15, 1906. A certified check of \$1,000 must accompany each and every bid.

The city reserves the right to reject any and all bids.

Street Paving

Readvertisement.

The Borough of Pottsville, Pa., will receive bids up to 7:30 o'clock P.M., Tuesday, August 21, 1906, for about 7,500 or 8,000 sq. yds. vitrified paving brick or block. Work to be commenced about April, 1907, season permitting.

Specifications and blanks will be furnished by Wm. S. Pugh, Borough Engineer.

The right to reject any or all bids is reserved.

G. A. BERNER, Town Clerk.

Canals and Ditches

Department of the Interior,
Washington, D. C., July 3, 1906.

Sealed proposals will be received at the office of the United States Reclamation Service, Williston, North Dakota, until 10 o'clock a. m., August 30, 1906, for the construction of canals and ditches, involving the excavation of about 220,000 cubic yards of earth and furnishing labor and material for various structures requiring about 40,000 feet B. M. of lumber and 1,000 cubic yards of concrete, in connection with the Williston Project. Particulars may be obtained from the Chief Engineer, United States Reclamation Service, Washington, D. C., or from H. A. Storrs, Electrical Engineer, Williston, North Dakota.

THOMAS RYAN,
Acting Secretary.

Torresdale Intake

Department of Public Works,
Bureau of Filtration, Office, 710 City Hall.
Philadelphia, August 2, 1906.

Sealed proposals, endorsed "Bids for Completing Torresdale Intake," and addressed to the undersigned, at the office above mentioned, will be received until 12 o'clock, noon, on Wednesday, August 22nd, 1906, for Contract No. 61, Completing Torresdale Intake.

Specifications, drawings and blank forms upon which bids must be made can be obtained at Room 712, City Hall.

No bid will be considered unless accompanied by a certificate from the City Solicitor that the provisions of an ordinance requiring proposal bonds when the bids exceed in amount five hundred dollars, approved May 25, 1860 (p. 81, West), have been complied with.

The Director reserves to himself the right to reject any or all bids, as he may deem best for the interests of the city.

THOMAS L. HICKS,
Director.

Street Lighting

Sealed proposals will be received by the Town Council of Pottsville, Pa., until 7.30 p.m., on Tuesday, Sept. 18, 1906, for lighting the streets of the borough and borough buildings with either electricity or gas for a period of five years from February 15, 1907.

"Bids for electric lighting to be for 137 or more arc lights and 50 or more incandescent lights for streets, with extra bids for buildings.

"Successful bidder to furnish approved bond in the sum of ten thousand dollars, conditioned for faithful performance of contract.

"A certified check for \$2,500 to accompany each bid, which shall be forfeited on failure to execute said bond and contract. Candle power and character of lamp to be designated in bid. Council reserves the right to reject any or all bids or parts of bids."

By order of Town Council.

Attest:—G. A. BERNER, Town Clerk.
Pottsville, June 19, 1906.

Street Improvements

NOTICE TO CONTRACTORS.

Paducah, Ky., Aug. 11, 1906.

Bids will be received at the office of the Board of Public Works, until 3 P.M., Aug. 29th, 1906, for the reconstruction of several streets with Vitrified Paving Blocks, Storm Water Sewers, Curbing and Granitoid Sidewalks.

Approximate quantities as follows:
18-inch pipe..... 1,695 lin. ft.
12-inch pipe..... 1,080 " "
10-inch pipe..... 1,020 " "
8-inch pipe..... 330 " "
6-inch pipe..... 1,381 " "
Manholes..... 15
Intakes..... 11
Excavation for paving..... 3,810 cu. yds.
Brick paving..... 7,161 sq. yds.
Combined curb and gutter..... 2,137 lin. ft.
Concrete curb..... 755 " "
Limestone curb..... 825 " "
Porous tile..... 2,942 " "
Driveways..... 2,570 sq. ft.

A certified check for \$500 must accompany each bid. Board of Public Works reserves the right to reject any and all bids. Specifications and plans can be seen at the office of the City Engineer.

L. A. WASHINGTON,
City Engineer.

Notice to Contractors

Sealed proposals will be received by the Clerk of the Village of Cadiz, Ohio, until 12 o'clock, noon, August 31st, 1906, for 17,700 square yards, more or less, of street paving with brick.

Plans and specifications can be seen and forms of proposals obtained at the office of the Village Clerk, or the Engineers, The Riggs-Sherman Company, 613 Nasby Building, Toledo, Ohio.

By order of the Council.

W. H. LUCAS, Town Clerk.

FOUNDATION OF ROADS is the subject now under most earnest investigation by Engineers throughout the World; poor foundations and good surfaces are found everywhere—result, short lived roads. THERE IS NOT ONE FOUNDATION ON THE MARKET TO-DAY THAT PROPERLY SUPPORTS THE SURFACE. The steel rail and the wooden cross tie is always the same, but the highway is a different thing; different surfaces and different foundations are required for different services. We have these different foundations; they DO properly support the surface, and, IN OTHER WAY, they give a lie to the surface that was never before even contemplated. **The Nash Road**, Borough of Brooklyn, N. Y. City, U.S.A.

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SPECIAL NOTICE

In the respective following issues of the Municipal Journal and Engineer considerable space will be devoted specially to the subjects as indicated:—

—1906—

September 5th - - THE CITY BEAUTIFUL
—Parks, Monuments, etc.
October 3d - - - FIRE AND POLICE
November 7th - - LIGHTING
—Gas, Electricity, Etc.
December 5th - - BRIDGES

Producer Gas and Gas Producers

BY
SAMUEL S. WYER

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- VI Classification of Gas-Producers.
- VII Manufacture and Use of Producer-Gas.
- VIII Use of Steam in Gas-Producers.
- IX Carbon Dioxide in Producer-Gas.
- X Efficiency of Gas-Producers.
- XI Heat Balance of the Gas-Producer.
- XII Fuel.
- XIII Requirements.
- XIV History of Gas-Producers.
- XV American Pressure Producers.
- XVI American Suction Gas-Producers.
- XVII Gas Cleaning.
- XVIII By-Product Gas-Producers.
- XIX By-Product Coke Oven Gas-Producers.
- XX Producer-Gas for Firing Ceramic Kilns.
- XXI Producer-Gas for Firing Steam Boilers.
- XXII Wood Gas-Producers.
- XXIII Removal of Tar from Gas.
- XXIV Gas-Producer Power-Plants.
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- XXVII Future of the Gas-Producer.
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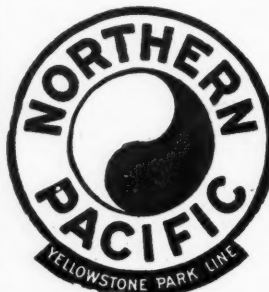
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